2002 NPDES Progress Report

Cedar-Green, Island-Snohomish, and South Puget Sound Water Quality Management Areas

National Pollutant Discharge Elimination System MS4 Permits WASM10001, WASM20001, and WASM30001

Submitted to:

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Water Quality Program
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SECTION 1.0
OVERVIEW

Pursuant to the National Pollutant Discharge Elimination System (NPDES) requirements for Multiple Separate Storm Sewer Systems (MS4), the Washington State Department of Transportation (WSDOT) prepared a Stormwater Management Plan (SWMP) which was approved by the Washington State Department of Ecology (Ecology) on 3 July 1997 [WSDOT 1997(a)]. The plan was prepared in response to the issuance of NPDES and State Waste Discharge General Permits issued on 5 July 1995 and effective on 4 August 1995 which designated WSDOT as a co-permitee for discharges from municipal separate storm sewers within the following water quality management areas:

- The Cedar-Green Water Quality Management Area (and the portion of the Kitsap Water Quality Management Area located in King County),

- The Island Snohomish Water Quality Management Area (and the portion of the Skagit-Stillaguamish Water Quality Area located in Snohomish County), and

- The South Puget Sound Water Quality Management Area (and the portion of the Kitsap Water Quality Management Area located in Pierce County).

The WSDOT SWMP was prepared to address the requirements specified under Section 122.26 of Title 40 of the Code of Federal Regulations (40 CFR 122.26), the Water Pollution Control requirements stipulated in Chapter 90.48 of the Revised Code of Washington (RCW 90.48), and the regulatory requirements for the NPDES permit program in Washington State as delineated in Chapter 173-220 of the Washington Administrative Code (WAC 173-220). The SWMP outlines WSDOT's plan to comply with federal and state standards for point source wastewater discharges; including compliance with the state and federal NPDES programs. The SWMP and associated permits cover large and medium MS4 discharges for the Cedar-Green, Island-Snohomish, and South Puget Sound management areas. As initially drafted, the three referenced NPDES MS4 permits were to expire on 5 July 2000. At this time new permit conditions are still being drafted by Ecology, and an administrative decision is pending regarding issuance of a single permit to WSDOT or whether the agency will continue to operate as a co-permitee with other municipal entities. The above-referenced permits were administratively extended by Ecology to continue

current permit requirements until the next permit(s) is (are) issued. Therefore, the 1995 permit requirements and associated 1997 SWMP remain in effect at this time.

One of the conditions of WSDOT's NPDES permit is that an annual report be prepared summarizing WSDOT's efforts to comply with the permits and SWMP, and evaluating the effectiveness of the stormwater program. The purpose of this 2002 Annual Report is to document stormwater-related activities for the period from 5 July 2001 through 4 July 2002, within the three NPDES MS4 permit areas. This report has been developed to reflect WSDOT activities based on the suite of commitments established in the SWMP.

In addition to the requirements placed on WSDOT by the NPDES program, the agency is also striving to meet stormwater management needs associated with the Endangered Species Act (ESA). Implementation of stormwater management practices relating to ESA considerations were previously defined in WSDOT Instructional Letter (IL) 4020.01, entitled *Endangered Species Act 7(d) Project List and Stormwater Effects Guidance,* which was effective on 15 July 1999, as amended on 1 June 2001, and which was to expire on 15 July 2002. On 25 February 2002, WSDOT issued IL 4020.02, entitled *Endangered Species Act (ESA) Stormwater Effects Guidance*, which superseded and replaced IL 4020.01. The purpose of IL 4020.02 is to provide interim guidance on making stormwater-related *effect determinations* for biological assessments that are prepared for the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). Instructional Letter IL 4020.02 is also intended to provide transitional criteria between the current WSDOT *Highway Runoff Manual* (WSDOT 1995) and the Ecology document entitled *Stormwater Management Manual for Western Washington* (Ecology 2001) which was released in August 2001.

The remainder of this report has been organized to provide an overview and status of the priority elements for the stormwater management program as outlined in the SWMP. Section 2 provides a summary of activities within the current reporting period for the six high priority elements identified in the SWMP. Section 3 provides an overview of the status of NPDES-related funding and resource allocations for the period. Section 4 includes an overview of maintenance practices and a general discussion of the status of stormwater facility management, and summarizes retrofit program planning activities during the current reporting period. Section 5 summarizes the activities relating to the construction site controls and training program, and Section 6 addresses activities relating to watershed-level management and planning as well as an update on WSDOT cost/benefit analysis efforts. Monitoring activities relating to the NPDES program are summarized in Section 7, along with the status of the research program over the past year.

The certification statement for the document is provided in Section 8. The references cited in the report are provided in Section 9. Unless otherwise specified, the references cited throughout this report are available through WSDOT's Environmental Affairs Office (EAO) Water Quality Program, and can be obtained upon request.

SECTION 2.0
STATUS OF STORMWATER PROGRAM PRIORITIES

There were six elements identified in the 1997 Stormwater Management Plan as having the highest priority. These included: (1) construction of structural stormwater best management practice (BMP) facilities, (2) monitoring and research related to stormwater BMPs, (3) erosion and sediment control programs, (4) attaining full funding for operations and maintenance programs, (5) watershed-based mitigation strategies, and (6) water quality-related training. These continue to be high priorities for WSDOT. Construction of structural controls at new outfall sites continues to receive increased emphasis due to the federal listings associated with salmon and other salmonids under the ESA.

As detailed in Section 3.0, during the 2001/2002 permit period WSDOT spent an estimated $15.3-million dollars on construction of structural stormwater controls at new outfalls, although expenditures relating to retrofits of existing stormwater outfalls were reduced from $1.14-million in the prior period to $200,000 in the current period. Expenditures continue to increase for efforts relating to educational programs and policy and guidance development. However, budgetary restrictions resulted in an overall decrease in funding opportunities for research programs.

Although funding availability limited expenditures, numerous efforts continued regarding stormwater-related monitoring and research. Section 7 of this report describes nine projects that are related to stormwater characterization and/or BMP performance-related monitoring and research. These projects have either recently been completed or are in progress. They include a wide range of previously identified research needs including: characterizing general stormwater runoff and pollutant levels in Western Washington through evaluations pertaining to the effectiveness of BMPs constructed using existing technology, evaluating innovative technologies, and evaluating appropriate and effective maintenance practices. During the current permit reporting period, approximately $138,000 was spent on these activities (refer to Table 3-1).

The Erosion and Sediment Control Program continues to develop and successfully implement procedures designed to provide improved training opportunities and to effectively control construction site impacts. During the reporting period, the Erosion Control Program office performed risk assessments of

approximately 30 construction sites and identified high risk sites for priority monitoring throughout the winter. In addition, approximately 380 WSDOT employees and 670 non-WSDOT personnel attended Construction Site Erosion Control Certification Training classes during the current reporting period. The expenditures for this program have increased to $229,000 (refer to Table 3-1). The availability of database resources and on-line information sources continues to expand, and existing support tools are routinely updated and maintained to support training, planning, and construction projects.

Full funding of the Operations and Maintenance Program has not yet been achieved. The 1997 SWMP identified that nine of 11 maintenance categories were previously under-funded by amounts ranging from 22 to 68 percent as compared to full funding levels. The funding increase approved in the 1997 budget was set to maintain the then current level of service, and a return to this level of funding has not yet been realized. The 1999/2000 budget decreased (refer to Table 3-1) from prior levels, likely a reflection of Initiative 695 revenue losses. During the current reporting period, a modest increase in Operations and Maintenance Program funding was realized, although not to the full funding levels originally anticipated for implementation of this area of stormwater management. However, substantial progress continues with regard to ice and snow control applications and management, and implementation of the integrated vegetation management program.

WSDOT has also continued to participate in watershed-based planning programs, including working in cooperation with other state and local agencies and planning groups to provide watershed-scale technical support. As was the case in the prior reporting period, watershed management activities in the Snohomish Basin (a specific program element identified in the SWMP) were not a focus this past year. However, WSDOT has implemented a new approach to watershed assessments based on a recommendation by the Transportation Efficiency and Accountability Committee which will reduce mitigation costs and enhance the public participation process. WSDOT continues to provide active representation on Watershed Management Act and Salmon Recovery Act-related committees throughout the permit area, and to lead the River Corridor Analysis efforts throughout the state. In addition, WSDOT was a key participant in the development of the Uniform Environmental Project Reporting System database that will serve to enhance efforts by a wide range of organizations to identify and coordinate environmental mitigation opportunities. While in the early stages of development, WSDOT has also focused available resources on assessing the costs and benefits relating to implementation of the various elements of the stormwater management program, and deriving a better understanding of life cycle maintenance costs for BMPs.

WSDOT has continued to sponsor conferences and workshops related to water quality topics and provide specific training to employees and training opportunities to outside personnel. Some specific examples include the Temporary Erosion and Sediment Control Program, Adopt-A-Highway Program, Trip Reduction Program, and wetland mitigation workshops. In addition, WSDOT continues to offer opportunities to the public to be involved in transportation planning activities.

Medium and low priority activities that were identified in the SWMP included; supporting public education programs, determining maintenance requirements for BMPs, developing a tracking system for structural BMPs, identifying illicit discharges, developing a tracking system for operations and maintenance activities, monitoring operations and maintenance practices relative to water quality impacts, and developing budgetary mechanisms to fund maintenance activities associated with water quality improvements. Progress continues to be made in most of the above categories subject to the availability of resources and funding, and progress continues with the ongoing development of revised systems for tracking stormwater facilities and prioritizing existing facilities for retrofits as described in Section 4.2.3.

In summary, WSDOT has continued to focus on previously defined priority needs, and is striving to meet the suite of commitments identified in the SWMP. Substantial progress has been made during the current reporting period in defining the key stormwater program management elements that require enhancement to support future funding, prioritization, and program implementation. Additional efforts have been made to ensure that WSDOT's efforts are well coordinated amongst the individual programs that participate in the various aspects of the NPDES compliance and implementation program.

SECTION 3.0
FINANCIAL AND RESOURCE ASSESSMENT

WSDOT's operating funds continue to be impacted by the passage of Initiative 695 and the loss in revenue previously obtained from vehicle license fees. This has affected funding for the water quality programs and related Stormwater Management Plan commitments. Table 3-1 depicts stormwater related expenditures for the 7-year period in which the current NPDES MS4 permits have been in place. These numbers were generated to reflect expenditures within the general NPDES Phase I permit area. It is provided for comparison with Table 25 in the Stormwater Management Plan [WSDOT 1997(a)] which projected budget estimates for the listed budgetary and activity areas through the 1999/2000 permit period.

TABLE 3-1. WSDOT STORMWATER MANAGEMENT PLAN BUDGET ELEMENTS AND STORMWATER EXPENDITURES OCCURRING WITHIN THE NPDES PHASE I PERMIT AREA (IN THOUSANDS OF DOLLARS)

Program Element	1995/1996	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001	2001/2002
Stormwater BMP Construction in Highway Improvement Projects	$20,000(1)	$20,000(1)	$20,000(1)	$20,000(1)	$15,220(1,2)	$15,333(1,2)	$15,313(1,2)
Stormwater Management Study to Determine Regulatory Redundancy and Evaluate Streamlining Opportunities for Stormwater Resource Management (Chandler/Fisher study)	$0	$0	$0	$0	$138	$0	$0
Snohomish Basin/Watershed Management Projects	$0	$0	$100	$100	$40	$0	$0
2SHB 2031 Program Administration	$0	$0	$100	$10	$10	$0	$0
2SHB 2031 Grants	$700	$0	$0	$0	$0	$0	$0
Stormwater Characterization and BMP Monitoring	$94	$94	$100	$100	$25	$79	$53
NPDES Permit Fees	$46	$46	$48	$50	$52	$52	$60
NPDES/ESA Erosion Control and Spill Prevention Training	$0	$0	$0	$0	$148	$194	$229
Highway Runoff Manual and Eastern Washington Stormwater Design Manual Development	$0	$0	$0	$0	$138	$0	$43
Stormwater and BMP Research Programs	$143	$143	$83	$83	$262	$370	$85
I-4 Stormwater BMP Retrofit Projects	$0	$0	$0	$0	$65	$1,141	$200
Stormwater Research Implementation	$0	$0	$98	$138	$140	$125	$26
Stormwater Utility Fees	$886	$886	$886	$886	$886	$886	$886
Stormwater Systems Operations and Maintenance	$2,587	$2,587	$2,815	$2,815	$1,598	$2,289	$2,677

(1) Estimated at 5 percent of total project costs.
(2) Reflects decreases for State Highway Improvement (Category I) projects resulting from decreases in revenue caused by passage of Initiative 695 in November 1999.

The large increase in spending on retrofit projects that occurred during the previous reporting period (WSDOT 2001) has decreased substantially due to budgetary constraints. Environmental management programs are typically conducted concurrently with capital improvement projects and expenditures are generally proportionate to funding levels for these projects. BMP construction expenditures remained

consistent with the prior reporting period. Although BMP and stormwater research expenditures have also decreased, due again to a response to decreased budgets, expenditures for erosion control and spill prevention training continue to increase. WSDOT's active support in the current development of the Draft Stormwater Management Manual for Eastern Washington is reflected in the budget elements for the current reporting period, and efforts have also been initiated to prepare an update of the Highway Runoff Manual.

SECTION 4.0
OPERATIONS AND MAINTENANCE

This section includes an overview of maintenance practices for operating highways and information on the annual maintenance of structural controls and BMPs, research developments in ice and snow control, summary information pertaining to de-icer quantities and expenditures, the use of pesticides and fertilizers, roadway sweeping, and the process of tracking hazardous material incidents. This section also includes a general discussion regarding stormwater facility management practices which describes newly constructed facilities, illicit discharge points, the revised outfall inventory, and the progress of the stormwater outfall retrofit program.

4.1 MAINTENANCE PRACTICES FOR OPERATING HIGHWAYS

Commitments to maintenance practices described in the SWMP include; (1) tracking maintenance and repairs to structural controls and BMPs; (2) estimating volumes of ice and snow control material and pesticides and fertilizers applied to roads, and research activities associated with those materials; (3) developing an Integrated Vegetation Management Plan; and (4) reporting highway sweeping activities and tracking hazardous material spills.

Proper road maintenance reduces impacts of vehicle use and road wear. It provides at least three benefits; it helps to ensure the safety of the traveling public, preserves the infrastructure, and can serve as mitigation for environmental impacts associated with road construction, preservation, and maintenance during the life of the structure.

4.1.1 Sensitive Area Mapping

To identify maintenance activities with stormwater related impacts and respond with appropriate BMPs, WSDOT is in the process of marking and mapping environmentally sensitive areas in the field. The purpose of this mapping project is to identify all sensitive area locations and provide guidance to WSDOT maintenance crews so that BMPs may be applied to eliminate or reduce impacts of maintenance activities on streams, wetlands, and water bodies. This effort was identified and summarized in the 6th Year NPDES Annual Report (WSDOT 2001), and an update on the status and schedule is provided below.

- **Sensitive Area Identification:** North Central and Southwest Regions (completed in 2000), South Central Region (completed in 2001), Northwest and Olympic Regions (completed in 2001), Eastern Region (completed in 2001).
- **Mapping of Sensitive Areas:** North Central and Southwest Regions (in progress, estimated completion in April 2003), South Central Region (atlases completed in 2002), Northwest and Olympic Regions (in progress, estimated completion in April 2003), Eastern Region (in progress, estimated completion in April 2003).
- **Training:** Training on BMPs was provided in 2001/2002.

4.1.2 Maintenance of Structural Controls and BMPs

As described in last year's progress report, there is no system specifically designed to track maintenance activities. Instead this information is evaluated indirectly through analysis of Transportation Allocation Information System (TRAINS) data. TRAINS is a labor accounting system that tracks activities based on highway segment, specific activity, labor, and equipment costs incurred.

The same estimating method described in the 6th Year NPDES Annual Report (WSDOT 2001) was used for assessment of maintenance activities in the current reporting period. TRAINS was queried to determine expenditures and personnel hours spent on specific activities. Because the TRAINS system tracks activities for the entire state, some manipulation was necessary to correlate the numbers to the NPDES permit areas. Detailed surveys of the number of stormwater systems (i.e., catch basins, separators, drainage facilities, or channel conveyance systems) controlled by WSDOT over small areas were first extrapolated to a region-wide estimate of the total number of facilities. This information was further extrapolated for each permit area based on the size of the area. This estimating methodology served as the basis for the development of Table 4-1. Although the information does not precisely reflect activity in the permit area, by using a consistent estimating method, differences between years can be evaluated.

Overall, expenditures and time commitments for stormwater-related operations and maintenance activities increased slightly in the 2001/2002 reporting period relative to the 2000/2001 reporting period. However, there were significant changes in the allocations for specific activities. For example, manhole and catch basin maintenance and application of ice control material increased. However, these differences are more a reflection of day-to-day operations and maintenance needs than a change in priorities.

TABLE 4-1. BUDGET AND PERSONNEL HOURS ALLOCATED TO STORMWATER FACILITY O&M ACTIVITIES IN THE NPDES PERMIT AREA AS TRACKED THROUGH THE TRANSPORTATION ALLOCATION INFORMATION SYSTEM				
O&M Activity Type	**Dollars Spent in 2000/2001**	**Dollars Spent in 2001/2002**	**Personnel Hours 2000/2001**	**Personnel Hours 2001/2002**
Grade/Reshape Shoulder	$190,000	$99,448	5,637	1,620
Sweeping and Cleaning Pavement	$599,000	$513,468	10,385	9,761
Ditching and Channel Maintenance	$125,000	$185,329	2,642	3,878
Culvert Maintenance	$175,000	$99,340	1,958	2,023
Manhole, Catch Basin, and Grate Maintenance	$199,000	$517,979	4,705	5,171
Detention/Retention Maintenance	$26,000	$ 31,541	339	65
Miscellaneous Drainage Maintenance	$203,000	$136,162	832	980
Weed Control Fertilizing and Liming	$1,000	$300	13	8
Residual Herbicide Application	$86,000	$93,577	1,448	1,641
Landscape Fertilizer and Liming	$1,000	$91	31	2
Litter/Litter Bag Clean-up	$209,000	$203,197	4,728	4,211
Winter Sand Clean-up	$58,000	$103,029	1,270	2,274
Sanding	$205,000	$323,368	1,732	3,264
Anti-icing and De-icing Chemical Application	$172,000	$324,396	1,215	1,877
Winter Drainage Maintenance	$3,000	$5,352	77	117
Hazardous Waste/Spill/Debris Clean-up	$37,000	$40,847	758	818
Total	**$2,289,000**	**$2,677,427**	**37,772**	**37,709**

4.1.3 Ice and Snow Control

As discussed in the 6th Year NPDES Annual Report (WSDOT 2001), WSDOT is an active participant in the Pacific Northwest Snowfighters (PNS). PNS is re-writing the *Snow and Ice Control Chemical Products Specifications and Test Protocols* based on the research completed in August 2001. The revised document is scheduled to be completed in the fall of 2002. The document will establish standardized procedures for research and monitoring activities related to anti-icer/de-icer products and application protocols.

The Maintenance Office at WSDOT tested a number of anti-icer/de-icer products [e.g., First Down®, All Clear®, Cal Ban 70®, Freez Gard 0, Calcium Magnesium Acetate (CMA), and standard sodium chloride (NaCl)] for corrosion of metals such as zinc, aluminum, and stainless steel. The state standard for de-icers is that they must be 70 percent less corrosive on steel than sodium chloride (salt). Project testing was completed in 2001 and a short paper with the findings was developed [WSDOT (undated)]. The findings are summarized below.

All of the anti-icer/de-icer products tested had minimal corrosive effects to zinc-plated steel and were all below the 70 percent threshold. Neither sodium chloride nor the anti-icer/de-icer products had notable corrosive impacts to either of the stainless steel alloys tested. Cal Ban 70®, Freez Gard 0®, and CMA® all tested below the 70 percent threshold for both aluminum alloys tested. First Down® exhibited mixed results for aluminum alloys, while All Clear® was significantly more corrosive than sodium chloride on both aluminum alloys tested [WSDOT (undated)].

Table 4-1 above provides a breakdown of maintenance personnel hours and expenditures allocated to snow and ice maintenance activities; including: (1) winter sand clean-up, (2) sanding, (3) anti-icing and de-icing chemical applications, and (4) winter drainage maintenance. Table 4-2 provides details on the quantities and costs of de-icer materials used in the two preceding biennia and in the current reporting period. Significant reductions have occurred in the number of products purchased for de-icing operations relative to the two preceding biennia. This reduction is directly related to the findings of the research programs conducted during prior reporting periods and the objects of minimizing water quality impacts resulting from chemical applications.

TABLE 4-2. DE-ICER QUANTITIES AND EXPENDITURES FOR SNOW AND ICE REMOVAL IN WASHINGTON STATE[1]

Product	1997/1999 Expenditures	1999/2001 Expenditures	7/01 to 6/02 Usage[2]	7/01 to 6/02 Expenditures[2]
CG90, 28% Magnesium Chloride (MG)	$89,567	$0	0	$0
CG90, 25% MG	$129,149	$5,691	0	$0
Sodium Chloride	$0	$73,856	0	$0
Liquid Freeze Gard IB4	$83,040	$6,114	0	$0
CG90, solid, original	$2,285,156	$0	0	$0
CG90, solid, original 10% MG	$212,858	$44,357	0	$0
CG90, solid, original 22% MG	$211,769	$107,031	0	$0
CMA, solid, super sack	$146,459	$282,030	353 Tons	$421,761
Ice Slicer Meltdown 10	$0	$68,378	0	$0
Liquid Cal Ban	$0	$1,795,600	9,801 Tons	$1,035,424
Ice Ban, 70% Calcium Chloride	$80,096	$27,021	0	$0
Corrosion Inhibited Sodium Chloride	$0	$0	9,584 Tons	$1,485,570
Liquid Magnesium Chloride	$0	$0	5,572 Tons	$390,071
Total	**$3,238,094**	**$2,410,077**	**29,310 Tons**	**$3,332,826**

[1] Note: These are state-wide values derived from the Transportation Allocation Information System.

[2] Quantities are estimated based on the price per ton. Expenditures are payments to vendors for de-icer products.

4.1.4 Integrated Vegetation Management

Herbicide use is tracked through a record of herbicide applications that includes: (1) the herbicide used (by trade name), (2) the total amount used, and (3) the number of acres treated. Table 4-3 summarizes the acres of right-of-way treated and quantities used by county. The method for calculating acreage treated has been revised from last year's report. These numbers more accurately reflect the true acreage treated, whether treated with one or a mixture of products, and reflect a substantial decrease in the number of products used, quantities, and acreage treated relative to the prior reporting period (WSDOT 2001).

TABLE 4-3. SUMMARY OF HERBICIDE PRODUCTS USED AND THE NUMBER OF ACRES TREATED IN NPDES PERMIT COUNTIES

County	Number of Products Used	Quantity Used		Approximate Number of Acres Treated
		Pints	Pounds	
Clark/Skamania	16	5,111	200	247
King	10	5,145	0	550
Pierce	11	5,826	975	547
Snohomish	10	3,455	0	388
Thurston	10	2,254	4,492	292

Herbicide applications for noxious weed control, nuisance weed control, and tree and brush control (site distance and clear zone) have not changed since the implementation of the operational improvements reported in the 6th Year NPDES Annual Report (WSDOT 2001).

WSDOT's guidance for Integrated Vegetation Management (IVM) for Roadsides continues to be used by local managers to guide and train field operators in roadside maintenance [WSDOT 1997(b)]. WSDOT is starting a pilot project to facilitate statewide implementation of the IVM and to better account for results. WSDOT seeks to develop information management tools to be used in the field to: (1) plan consistent routine maintenance activities, (2) identify and prioritize vegetation problem areas, (3) develop long-term treatment strategies, (4) document actions taken to carry out treatments, and (5) monitor the effectiveness of maintenance treatments. These tools will also help to ensure that consistent routine vegetation maintenance activities are carried out.

The Interstate 5 corridor, much of which is included in the NPDES permit area, has been selected as the pilot project study area. The objective of this project is to identify and implement revised maintenance practices which improve the health and aesthetics of the roadside while reducing long-term maintenance costs. The Interstate 5 Corridor Roadside Vegetation Management Plan will document agreed upon

parameters for roadside vegetation maintenance activities and outcomes by milepost, and establish a data management system for follow through and tracking of costs and assessing the effectiveness of treatment measures. An additional component of the system will be a database of plant-specific BMPs and IVM treatment prescriptions. A detailed scope has been completed for this project (Willard, R. 2002).

4.1.5 Roadway Sweeping

Approximately 9,761 hours of personnel time and just over $500,000 were spent sweeping the highways within NPDES permit areas to remove large particulate matter that would have otherwise entered the stormwater systems. This represents a slight reduction in time and budget over the previous reporting period.

4.1.6 Hazardous Material Tracking

Efforts to track hazardous material spills are currently conducted in conjunction with the Washington State Patrol and/or the local law enforcement agency responding to the site of an accident. The information is documented on an accident form, which currently records only whether a hazardous material was involved, and if so, if a release occurred. It does not document the material involved, the quantity released, or the clean-up status. The reporting format is currently scheduled for revision in 2005. The WSDOT Transportation Data Office, in conjunction with the Environmental Affairs Office Environmental Information Management Program, is in the process of formulating an approach and process to upgrade the Traffic Accident Data System to incorporate additional information regarding hazardous materials incidents on the state highway system. This is expected to be an effort requiring the coordination of multiple state and local agencies. At this time, information regarding the involvement of hazardous materials in collisions is added to the notes section of the tracking system. The information is then entered into the collision records system. This system is currently backlogged, and obtaining data relating to hazardous material incidents pertaining to this permit reporting period was not possible.

4.2 STORMWATER FACILITY MANAGEMENT

The commitments to stormwater facility management, as described in WSDOT's Stormwater Management Plan, include: (1) reporting the numbers and types of permanent stormwater control BMPs constructed, (2) inventorying illicit discharge connections and monitoring corrective actions,

(3) identifying stormwater outfalls that need retrofits, and (4) continuing to modify/upgrade the retrofit prioritization index, as needed.

4.2.1 New Facilities

The SWMP identified construction of permanent structural stormwater BMPs as its highest priority. Facilitating construction of BMPs to treat WSDOT's highway runoff, either through transportation improvement (capacity expansion) projects or by stand alone retrofits, is believed to be the most efficient way to promote compliance with state water quality standards. WSDOT Regional Offices are required to investigate the feasibility of upgrading stormwater facilities during a highway improvement project. Determining feasibility is dependent on the level of available funding and right-of-way to construct stormwater BMPs.

As specified and required under WSDOT's Highway Runoff Manual (WSDOT 1995) and the *Stormwater Management Manual for Western Washington* (Ecology 2001), whenever a roadway is expanded by greater than 5,000 square feet of impervious surface, WSDOT oversees the construction of permanent structural BMPs to treat runoff for both water quality and quantity. Table 4-4 provides a summary of BMPs constructed within the general permit areas between July 2001 and July 2001. A description of each BMP type with milepost, offset direction, and facility size (where available) is provided in Appendix A.

As indicated on Table 4-4, there were a total of 130 BMPs constructed within the general permit areas during the current reporting period. This represents approximately a 45 percent increase over the number of structural BMPs constructed during the previous reporting period (WSDOT 2001). There are also many vegetated conveyances, filter strips, and buffer zones that exist along many state highways that are essentially functioning as structural stormwater BMPs, but were not engineered specifically for that purpose. Additional stormwater facility inventory efforts are planned to more accurately assess the current status of stormwater management and control facilities within the state highway system (refer to Section 4.2.3).

TABLE 4-4. STRUCTURAL STORMWATER BEST MANAGEMENT PRACTICES COMPLETED IN THE NPDES PERMIT AREAS DURING THE 2001/2002 CONSTRUCTION SEASON				
Project Designation	**Number and Type of Structural BMPs Constructed**			
	Open Water Detention [1]	**Detention Vaults [2]**	**Infiltration Pond [3]**	**Linear Treatments [4]**
SR 500 – Thurston Way Interchange	1			
SR 500 – Ward Road to NE 162nd Avenue – Stage 1				28
SR 503 – NE 76th Street to NE 144th Street		4	1	
SR 20 – Zylstra Road				2
SR 20 – Damnation Creek Bridge				6
SR 520 – Bike Path – Bellevue to Redmond				1
SR 5 – Null Road to Sammamish		7		1
SR 522 – Paradise Lake Road	3			2
SR 516 – Wax Road to Cedar Heights				3
SR 2 – Snohomish River to Cavalero Corner	5			
SR 18 – Holder Creek	1		1	
SR 405 – Bothell to Swamp Creek	1	5		4
SR 525 – Cameron Road to SR 20		3	3	14
SR 525 – SR 99 Interchange	6	6		
SR 5 – 38th Street Interchange	4			
SR 5 – Sleater Kinney Interchange to College Street Overcrossing				1
SR 16 – Sprague Avenue I/C to Snake Lake – HOV	2			
SR 99 – 62nd Avenue East to King County Line	2			1
SR 167 – River Road Safety Improvements				1
SR 509 – Port of Tacoma Road Grade Separation	3			4
SR 510 – SR 5 to Pacific Avenue			3	
SR 507 – Bald Hill Road to MP 36.5				1
Totals	**28**	**25**	**8**	**69**

[1] Open water detention includes detention ponds, wet ponds, and combination ponds.
[2] Detention vaults include drywells, wet vaults, swirl concentrator vaults, and oil/water separators.
[3] Infiltration pond includes infiltration ponds and dry ponds.
[4] Linear treatments include biofiltration swales, infiltration trenches, ecology ditches, and vegetated ditches.

4.2.2 Illicit Discharge

To more readily track observations/reports of illicit discharge points, the WSDOT Water Quality Program and Maintenance Office anticipate implementing an information tracking system to record observations of illicit discharges as a part of the revised Stormwater Facility Inventory Database (refer to Section 4.2.3, Outfall Inventory and Retrofits). The Environmental Affairs Office at WSDOT is leading the effort to revise and reformat the existing database, and to update the current stormwater facility inventory procedures. There is no proactive program in place at this time for locating illicit discharge points. However, to the extent possible, maintenance personnel will note the presence of a suspicious substance within the right-of-way, attempt to determine the source, and report the incident to the appropriate

jurisdiction. WSDOT does not have the authority to prohibit discharges that originate off of its right-of-way, or to initiate enforcement actions if those discharges create a problem that is not related to the safety or integrity of the state highway [WSDOT 1997(a)]. During the initial WSDOT stormwater facility inventory within the NPDES permit areas, observations of illicit discharge connections were generally noted in field records and outfall inventory forms. However, a formal policy or procedure has not been established at this time to report or enforce actions relating to illicit discharges found within WSDOT's right-of-way. Before committing to a more intensive inventory or investigative process, a response system for corrective actions will require development.

4.2.3 Outfall Inventory and Retrofits

Identification of stormwater outfalls and retrofit needs continues to be a critical agency need, and a significant effort has been made during the current reporting period to support this activity and provide the necessary management tools to proceed with program implementation. WSDOT conducted its initial inventory of stormwater facilities over the period from approximately 1993 to 1995, and at that time created a database containing inventory records for approximately 3,700 facilities. A retrofit prioritization index was developed in conjunction with the initial inventory effort, and approximately 600 outfall facilities were assigned a prioritization index based on a set of variables assessing potential water quality impacts and costs and benefits of BMP retrofits. During the 2002 reporting period, the outfall inventory database that was developed in 2001 was substantially revised, a supplemental stormwater facility re-prioritization effort was completed, and efforts have been initiated to standardize procedures for conducting stormwater inventories and to prioritize locations for retrofit improvements. Each of these efforts is described in the following paragraphs. WSDOT has identified the stormwater facility inventory, programming, and retrofit implementation process as a priority over the next three biennia, pending the status of available funding.

During the current reporting period, the WSDOT EAO Water Quality Program developed a decision package to serve as the funding request basis for continued implementation of the stormwater retrofit program. In support of this effort, a comprehensive work plan was developed which outlined the primary tasks and timeframes for activities associated with the assessment, prioritization, and programming process for identifying candidate retrofit locations throughout the state. The needs identified in this package were defined based on the findings of the program evaluation that was conducted during the prior reporting period with regard to the overall status and quality of the existing stormwater facility inventory, the estimated number of stormwater facilities present within the state highway system, information

management needs, and staffing requirements for implementation. Programming and planning estimates relating to the stormwater facility retrofit program were carried out over the next three biennial periods.

During the prior reporting period, WSDOT conducted a data needs analysis and developed a design specification for an improved stormwater facility inventory database. In 2001, a modified version of the database was constructed which included converting the existing singe-table data structure to a set of relational data structures in a client-server environment, and development of appropriate data systems to facilitate future expansion. Data from the original database was then migrated to the revised relational structure.

During the 2002 reporting period, significant changes were made to the WSDOT stormwater facility inventory database in the form of information updates, data cleanup and normalization, development of database documentation, and incorporation of supplemental information tracking systems relating to maintenance-based inspections and operations. Revisions were also made to the user interface to reflect a simplified object model, and a series of new report formats were prepared. The revised database was uploaded onto the WSDOT computer network in April 2002 for use in ongoing project delivery efforts, and in anticipation of pending efforts to augment the stormwater facility inventory and substantially modify the inventory procedures and prioritization process. Supporting documentation prepared in conjunction with the revisions to the database included the following:

- *Washington State Department of Transportation Stormwater Information Management System Data Dictionary, Version 1.1*, dated April 2002; and

- *Washington State Department of Transportation Stormwater Information Management System Screen Guide, Version 1.1*, dated April 2002

As discussed in the following sections, the revised database will be utilized as a part of a pending stormwater facility inventory pilot program (scheduled for implementation in late 2002/2003), and will be modified as necessary following the completion of that effort.

During the prior reporting period, WSDOT revised the stormwater facility retrofit prioritization index to address ESA concerns and made a series of other modifications and updates. These modifications were made in coordination with an inter-agency committee convened to address a range of issues relating to the environmental retrofit program. The revised stormwater facility prioritization index and ranking system

was then used to re-prioritize 303 outfall locations in the stormwater facility database. A summary of the modifications made to the stormwater facility retrofit prioritization index is provided as follows:

- **Beneficial Uses of the Receiving Water Body:** Modifications to the index were made to address considerations of hydraulic connection and relative distance to the subject receiving water body and the ESA listing status for the receiving water body.

- **Highway Contribution to Total Runoff in Watershed:** Consideration of percent highway drainage contributing to the watershed was supplemented with a new parameter including total impervious surface area contributing to the watershed.

- **Highway Contribution to Runoff:** Updated information pertaining to average daily traffic (ADT) counts was also incorporated into the revised prioritization index and considered in the re-prioritization process.

- **Quality of Receiving Water:** Additional modifications were made to the index to give additional weight to marine water and Class AA and B receiving waters to address ESA considerations.

- **BMP Capital Construction Cost:** Revised preliminary cost estimates for implementation of stormwater mitigation measures at the specified locations were incorporated into the re-prioritization process using a revised unit cost-based estimating procedure.

During the current reporting period the results of the revisions to the prioritization indices for these locations were distributed to each of the WSDOT regions for use in scoping candidate retrofit projects for the upcoming biennium. Implementation of stand-alone retrofit projects is contingent on the availability of funding.

Utilizing the procedures and approach implemented to conduct the re-prioritization effort discussed above, the WSDOT EAO Water Quality Program initiated the process of revising prioritization index values for an additional 321 stormwater outfall locations during the current reporting period. These locations (referred to as Tier II facilities) represent facilities that had been previously inventoried and assigned a preliminary priority rating, that had sufficient information available to facilitate re-prioritization following the established revised protocols, but required substantive updates and research to document the scoring process. A total of 303 of these locations are present in the WSDOT Northwest,

Olympic, and Southwest Regions which are the primary locations included in the NPDES Phase I MS4 permit areas.

The results of this re-prioritization effort were documented on a series of linked tables that include a summary of the new prioritization index values and the individual parameter values composing those scores, followed by individual tables that document the scoring basis for each of the 18 component parameters. A detailed documentation summary was also prepared which provides personnel involved in the retrofit process with a comprehensive description of the basis for derivation of individual parameter scores and the assumptions used, where necessary, to complete this effort. For documentation purposes, the previous prioritization index and individual parameter scores were retained, where available. This information will be distributed to WSDOT regional offices for continued implementation of the stormwater retrofit planning and programming process.

WSDOT has also initiated an effort to implement a pilot-scale stormwater facility inventory and training program. The primary intent of this effort is to provide a comprehensive assessment of the recently developed or revised stormwater management retrofit planning and programming systems, and to develop an inventory and prioritization process for distribution and implementation throughout the state. During the current reporting period, efforts began to develop a training program that will promote consistency in interpretation with regard to observed field conditions, effective selection of mitigation technologies, and accuracy in the development of preliminary cost estimates for BMP implementation. In addition, the need has been identified to ensure that all location-specific research (e.g., watershed area definitions and planning status, critical habitat designations per the ESA, receiving water quality) is completed in a manner that supports consistent data management and subsequent stormwater facility prioritization efforts. Substantial revisions are also being made to the field inventory forms that are utilized during the inventory process, and this effort is being conducted in a manner which will enable the prioritization process to become an automated function of the revised stormwater facility inventory database. Following completion of the development of the training course, a five to six month field inventory program will be conducted in the WSDOT Northwest and Southwest Regions. Based on prior findings pertaining to the current utility of the information collected during the initial field inventory effort (1993-1995), it is anticipated that approximately 25 to 35 percent of the facilities inventoried in the pilot program will be locations that were included in the initial inventory.

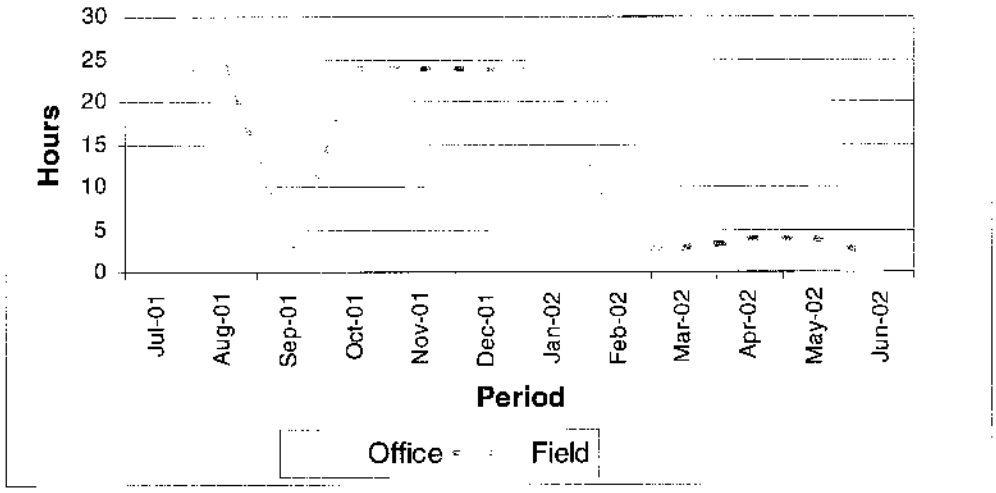
SECTION 5.0
CONSTRUCTION SITE CONTROLS AND TRAINING

WSDOT's Erosion Control Program is responsible for overseeing project Temporary Erosion and Sediment Control (TESC) implementation, providing effective training programs for employees and contractors, providing technical assistance for construction projects, maintaining applicable database sources, and evaluating existing and new erosion control practices for efficacy. The overall goal of the Erosion Control Program is to aid in timely and cost-effective project delivery while minimizing environmental degradation caused by erosion. The following discussion outlines WSDOT's erosion control activities related to NPDES permit requirements for the current reporting period.

5.1 TESC IMPLEMENTATION

An important role of the Erosion Control Program is providing technical assistance to WSDOT design and construction offices. This assistance includes: (1) review of TESC implementation plans, (2) providing consultations on BMP selection and implementation procedures, (3) providing technical support with regard to erosion and sediment control policy and procedures, and (4) conducting field site reviews. It is the goal of the Erosion Control Program to respond to all field technical assistance requests within 24 hours and to provide phone consultations within 4 hours. Figure 5-1 depicts the technical assistance response time for Erosion Control Program staff for this reporting period.

Figure 5-1. Technical Assistance Response



In addition to responding to specific technical assistance requests, a statewide assessment of construction sites was performed in the fall of 2001. Within the Northwest, Olympic, and Southwest Regions, which are those that are located within the NPDES permit areas, a total of 30 site assessments were completed. Each site was evaluated and rated for overall risk, erosion control considerations, off-site impact potential, and site damage. Sites that were assessed as a high risk were closely monitored throughout the winter.

5.2 PROGRAM SUPPORT AND DEVELOPMENT

During this reporting period the Temporary Erosion and Sediment Control/Spill Prevention Control and Countermeasure (TESC/SPCC) Assessment Database was developed. This database contains site assessment information obtained from routine construction site visits. The site assessment form that was developed in conjunction with the database (Appendix C) is expected to improve TESC/SPCC plan performance by helping to identify site deficiencies and by serving as a tool to ensure that the minimum requirements of the *Highway Runoff Manual* (WSDOT 1995) are met, and are supported based on established standard specifications. The database will allow WSDOT project, regional, and state managers to have site-specific and up-to-date information on TESC/SPCC performance. Development of the database was completed in June 2002, and an effectiveness evaluation will be provided in the next reporting period. The database will also be utilized to direct future WSDOT Erosion Control Program policy, including:

- Assisting WSDOT with identifying training needs in the various erosion control curriculums.

- Providing guidance in determining whether additions or modifications are needed to existing standard specifications pertaining to erosion and sediment control or spill prevention.

As noted in the 6th Year NPDES Annual Report, substantive changes have been made to WSDOT's Standard Specifications for erosion and spill prevention on construction projects [WSDOT 2000(a)]. These changes were made to provide WSDOT with sufficient contractual control to enforce erosion and spill prevention requirements on construction sites to the standards set in NPDES construction permits. During the current reporting period, Section 8-01 of WSDOT's *Standard Specifications for Road, Bridge, and Municipal Construction, M41-10* [WSDOT 2000(a), as amended], was amended to provide contract

language for enforcing the new *Stormwater Management Manual for Western Washington* (Ecology 2001) on all WSDOT projects.

5.3 NEW TESC PRODUCTS RESEARCH

The Erosion Control Product and Service Database (i.e., the Products and Services Catalog for Erosion and Sediment Control described in the 6th Year NPDES Annual Report) was completed in March 2001 and is updated annually by the Erosion Control Program. The Erosion Control Products and Services Database can be accessed at the following:

- http://www.wsdot.wa.gov/eesc/environmental/programs/hazwqec/wqec.htm

As a part of the process of maintaining this database, WSDOT has established a process to evaluate new products and procedures which may be approved for the Department's use on construction and maintenance projects. Applications for new products and procedures are evaluated initially by the section to which they will apply most directly. Following the initial review, findings and recommendations are then presented to the New Products Committee for action. The New Products Committee reviews the information for approval or for addition to the qualified products list (QPL). The committee, which meets on a quarterly basis, makes decisions as to whether to approve, approve with condition, or not to approve each new product. If a product is approved it is included into the QPL. The QPL can be accessed at:

- http://wsdot.wa.gov/fossc/mats/qpl/QPL.cfm

5.4 EROSION CONTROL TRAINING PROGRAMS

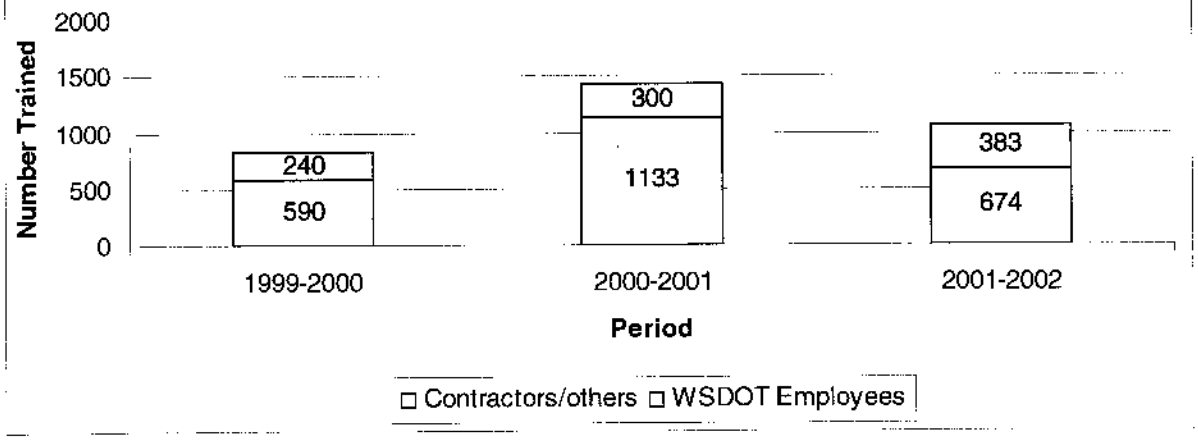
Keeping contractors and WSDOT employees abreast of the new methods and products available for erosion control is a key responsibility of the Erosion Control Program. All contractors involved in WSDOT projects are required to have a certified Erosion and Sediment Control (ESC) Lead working on the project. Attendance at a Construction Site Erosion and Sediment Control Certification Course is required for this certification. Through WSDOT's Erosion Control Program, training opportunities are provided throughout the State of Washington in cooperation with outside training partners, including contractors and local agencies. The curriculums for the training sessions are routinely updated.

In this reporting period, the Construction Site Erosion and Sediment Control Certification Course curricula was updated to address changes in the new *Stormwater Management Manual for Western Washington* (Ecology 2001) and the recently revised *Standard Specifications for Road, Bridge, and Municipal Construction* (WSDOT Engineering Publication M 41-10, as amended). During the current reporting period, 74 out of 75 WSDOT projects involving earthwork had certified ESC Leads. The one contractor whose certification had expired was directed to re-certify at the next available course.

During the 2001/2002 reporting period, over 1,000 people took the certification course; including 383 WSDOT employees (Figure 5-2). As a result of these efforts, the number of certified WSDOT employees increased to an average of eight per Project Office, a 37 percent increase over the previous reporting period.

In addition to the construction site certification program, training was also provided for Temporary Erosion and Sediment Control (TESC) planning. WSDOT taught the recently developed Erosion Control Design Course to an additional 101 employees.

Figure 5-2. Number of Attendants at Construction Site Erosion Control Certification Training



SECTION 6.0
OTHER PROGRAM COMPONENTS

This section of the WSDOT 2002 NPDES Annual Report contains information on other aspects of the Stormwater Management Program that have not been addressed in the Operations and Maintenance or Construction Site sections. It includes information on watershed planning and inter-agency coordination efforts, and status and progress on cost-benefit analyses for BMP selection and implementation.

6.1 PLANNING AND TMDL PARTICIPATION

WSDOT is continuing to develop a watershed approach to direct transportation mitigation dollars toward projects that satisfy mitigation requirements while contributing toward high priority watershed recovery efforts. In support of this objective, WSDOT is working with other state and local agencies and planning groups to provide watershed-scale technical support. This support includes; participation in local/regional watershed planning, direct technical support to transportation planning projects, comprehensive watershed-wide characterization and assessment of major project impacts, and the identification of potential mitigation opportunities.

A key piece of WSDOT's watershed-based planning is development of a new approach to completing watershed assessments. This work was recommended by the Transportation Efficiency and Accountability Committee (TPEAC) and mandated by the legislature. Essentially it has involved developing a new process for evaluating transportation corridors for the future. It is anticipated that this new evaluation process would occur well in advance of project planning, and will provide significant benefits to the environment by reducing mitigation costs and strengthening the National and State Environmental Policy Act (NEPA/SEPA) documentation and public participation process. The new evaluation process and underlying assumptions are currently being tested on a pilot project at SR 522. Although it is still early in the study, the new technique has already generated interest from other states and the federal government.

Another important watershed-based tool that WSDOT has championed is the Uniform Environmental Project Reporting System (UEPRS). This is a statewide, web-based database of funded and un-funded

priority projects that are identified by watershed. All state agencies, local jurisdictions, and conservation organizations have been encouraged to enter their project information into this database. This database is significant to watershed planning because it will enhance efforts by different organizations to research priority projects and to more easily identify and coordinate mitigation opportunities. It is expected that this database will be used by the Salmon Recovery Fund (SRF) board, Ecology, and others involved in funding and prioritizing projects.

WSDOT continues to participate on committees associated with the Salmon Recovery Act (ESHB 2496), the Watershed Management Act (ESHB 2514), and numerous other state and local agency forums related to watershed governance and planning structures. WSDOT staff actively participates with the Chehalis Basin Partnership [Water Resource Inventory Area (WRIA) 22 and WRIA 23], the Puyallup River Watershed Council (WRIA 10), and the Nisqually Watershed Council (WRIA 11). WSDOT also provides outreach to other watershed groups as requested. Technical support is provided by a team of specialists that includes a hydrogeologist, hydrologist, floodplain specialist, landscape ecologist, and others.

Participation by WSDOT on the Interstate 405 Corridor Program in WRIA 8 (Cedar/Sammamish River Basin) and WRIA 9 (Duwamish/Green River Basin) is ongoing. The purpose of this program is to find solutions to freeway and neighborhood congestion while protecting important natural resources and the fish that rely on them. WSDOT also continues to lead the River Corridor Analysis effort to identify reach-scale restoration opportunities throughout the state.

In the Yakima Basin (WRIA 39), WSDOT is actively engaged in an alternative analysis design process for the SR 24 bridge to select a new alignment that best meets local floodplain planning goals. This effort is also related to recommendations from TPEAC. Also in the Yakima Basin, WSDOT is completing a reach analysis related to chronic environmental deficiencies on a portion of the Naches River. This level of reach-specific analysis has also been provided for the Chehalis and Hoh Rivers (WRIA 20). Although these projects are outside the NPDES permit area, they are further examples of the range of support WSDOT is providing to assist with watershed-based environmental planning, mitigation, and restoration efforts.

6.2 OPERATION AND MAINTENANCE COSTS AND COST/BENEFIT ANALYSIS

The WSDOT Cost/Benefit Analysis Program within the Environmental Affairs Office continues to build on the progress made during the prior reporting period. This program includes the following elements related to stormwater management:

- Development of a set of stormwater treatment cost functions that include both construction and operations and maintenance costs for various BMPs. The life cycle concept will be applied to allow comparison of BMPs with varied life cycles.

- Development of stormwater treatment unit benefits from other BMP effectiveness studies. Benefits will be derived based on factors such as unit benefit, BMP effectiveness, water quality, volume control, pollutant loading, and beneficial use weights.

- Conducting case studies of typical BMPs, performing standard BMP cost/benefit analysis, and incorporating the results into the Highway Runoff Manual to aid in selection of efficient BMPs.

In addition to developing these program elements, a research project to evaluate several new BMPs was funded by the American Association of State Highway and Transportation Officials (AASHTO). A cost/benefit analysis will be one component of the project.

During the current reporting period, a report regarding the implementation of cost analyses for NPDES stormwater control requirements was completed in cooperation with Ecology. This document is entitled *Cost Analysis; Washington Department of Ecology Year 2001 Minimum Requirements for Stormwater Management in Western Washington,* and was finalized in August 2001 (Herrera Environmental Consultants 2001). This cost analysis provides information regarding the cost impacts of the updated Ecology stormwater manual. It is intended to be used by stormwater program managers needing to comply with NPDES requirements throughout the state. The document is referenced in the updated stormwater manual and is linked on Ecology's website.

Another cost report regarding the implementation of NPDES stormwater control and ESA requirements, entitled *Cost Analysis: Stormwater Management for Highway Improvement Projects in Western Washington,* will be completed in October 2002 by Herrera Environmental Consultants. This cost

analysis provides information regarding the cost requirements of the ESA and updated Ecology stormwater manual for highway improvement projects. It is intended to be used by policy makers and project managers in transportation sectors.

WSDOT will also be preparing a stormwater benefit cost report for the Federal Highway Administration. This report will identify major cost drivers related to highway stormwater management and discuss policy options for efficient stormwater management.

Finally, a stormwater application model is currently being developed by WSDOT. This web-based application is designed to assess both costs and benefits of stormwater treatment and identify cost effective alternatives. This application consists of models that are designed for meeting three levels of business needs; including: (1) policy development, (2) project planning, and (3) project design and permitting. Policy analysts will use the model to analyze policy impacts. Planners will use the model to provide more accurate budget data and improve long-range plans. Project managers will also use it to rank potential environmental retrofit projects; and support programming, planning, and estimating for priority needs. Design engineers will use the model to determine the practicality of implementing specific stormwater mitigation practices. The software for the model is currently expected to be available in 2003.

SECTION 7.0
MONITORING

This section of the document includes a description and summary of findings from stormwater characterization monitoring, BMP effectiveness/performance monitoring, and research monitoring activities that have occurred within the past year. Summary information pertaining to the status of specific WSDOT stormwater monitoring projects is also provided in tabular format in Appendix B to this document.

7.1 STORMWATER CHARACTERIZATION

The commitments to stormwater characterization monitoring described in WSDOT's SWMP include; routine monitoring of stormwater for total and dissolved solids, metals, nitrates, phosphates, petroleum products, and polynuclear aromatic hydrocarbons (PAHs); annual priority pollutant and pesticide scans; and wet and dry season testing of toxicity using Microtox (BBT) assays. Since development of the SWMP it has been determined that Microtox testing does not provide substantial benefit relative to costs and uncertainties in data interpretation; therefore, plans for implementing this analysis as part of ongoing characterization efforts are not currently a part of WSDOT's monitoring strategy.

7.1.1 General Characterization Monitoring

The purpose of this portion of the monitoring program is to characterize the quality of stormwater generated by state highways within the permit areas. Since stormwater quality may differ depending upon roadway use, four categories as defined by average daily traffic (ADT) volume have been identified. These include low volume roadways (less than 30,000 ADT), medium volume roadways (30,000 to 100,000 ADT), high volume roadways (100,000 to 200,000 ADT), and ultra-high volume roadways (greater than 200,000 ADT).

Low, medium and high volume sites were selected that were close to Olympia, Washington. This was done to improve monitoring efficiency and reduce costs as well as to minimize differences in the character of the rainfall events. Based on consideration of issues pertaining to the availability of funding

to support the characterization effort, the general characterization mobilization, set-up, and monitoring effort was initiated in the Spring of 2002. The three sites selected for monitoring are described below.

Low Volume: This site is located near milepost (MP) 16 on SR 8 and has an ADT of approximately 15,000 and an estimated drainage area of 3.4 acres. The site was previously used for stormwater research as summarized in the WSDOT 4th Year NPDES Annual Report (WSDOT 1999). At the project site, SR 8 is a four-lane highway with two eastbound and two westbound lanes. Highway runoff from the eastbound lanes is directed through a wide grassy median strip to a culvert that discharges adjacent to the westbound lanes. Highway runoff from the westbound lanes sheetflows off the side of the road. Although runoff from the eastbound lanes is treated and detained to some extent in the median strip it is considered to represent a valid characterization of low volume site pollutant contributions, since this is a common configuration for rural highways in the State of Washington.

Medium Volume: This site is located near MP 363 on SR 101. SR 101 at this location has an ADT of approximately 39,000 and has an estimated drainage area of 3.8 acres. SR 101 in the project vicinity is also a four-lane highway, with two eastbound and two westbound lanes. Runoff from both the eastbound and westbound portions of this highway segment are directed via catch basins and a vegetated median strip to a culvert that discharges on the north side of the westbound lanes.

High Volume: This site is located near MP 106.5 on Interstate 5 in Olympia. Interstate 5 at this location has ADT of approximately 127,000 and the surface drainage area was estimated to be 6 acres. In the project area, the Interstate is six-lanes wide (three eastbound and three westbound lanes), with two exit ramps (one each direction). Untreated runoff from all of the travel lanes is directed via a series of culverts to a single culvert that drains to a stormwater treatment facility (detention pond, waterfall, bioswale, and a wetland cell) located on the south side of the highway.

A monitoring and quality assurance/quality control (QA/QC) plan (Tetra Tech and Envirovision 2002) has been prepared for this general characterization monitoring and is on file with the WSDOT EAO Water Quality Program. Automatic samplers were installed in April 2002 and two storm events were monitored during May 2002 at the SR 101 medium ADT and the Interstate 5 high ADT sites. The configuration of the SR 8 sampling station is typical of that for rural highways in the state, with flow off the shoulder to vegetated portions of the right-of-way. Due to the relatively low intensity of the storms that occurred following mobilization, insufficient runoff volumes were generated to facilitate sample collection at this location during the reporting period. The samples collected from the referenced

sampling stations were analyzed at the laboratory for total suspended solids (TSS), total dissolved solids (TDS), chemical oxygen demand (COD), hardness, total phosphorous, 5-day biochemical oxygen demand (BOD5), nitrate/nitrite content, and the inorganic elements cadmium, copper, lead, and zinc. In accordance with the referenced monitoring plan, grab samples were collected on the rising limb of the storm hydrograph during one storm event and analyzed for the presence of total petroleum hydrocarbons (TPH). Sampling for ortho-phosphorous content was not conducted during this reporting period, but will be included in the characterization monitoring. QA/QC checks have been completed for the analytical results and the data has been entered into a database.

Although the data set derived from the stormwater characterization monitoring effort is limited, a preliminary comparison of findings was conducted relative to the historical mean concentrations of those constituents present in the WSDOT Stormwater Management Plan [WSDOT 1997(a)]. The analytical results derived from the characterization monitoring efforts during the reporting period generally indicated that pollutant levels were present either below the published range of the historical mean concentrations for these constituents or were present at values at or near the low end of the range. The hardness values for the samples collected in the current reporting period were relatively low for the two sample stations, ranging from 12 to 26 milligrams/liter (mg/L). Dissolved lead was not detected above laboratory reporting limits, and the remaining metals concentrations were generally within the ranges published in the Stormwater Management Plan. TSS values ranged from 65 to 136 mg/L, and were also generally within the lower end of the range of published values. Stormwater characterization monitoring is scheduled to resume in the 2002/2003 wet weather season, and a complete data summary report of the stormwater characterization monitoring effort is planned for completion in the next reporting period.

Stormwater characterization sampling is currently scheduled to resume in the 2002/2003 wet weather season. Pesticide and priority pollutant metals monitoring has also occurred at the medium and high volume ADT sites, and details of this effort are described in Section 7.1.2.

Some additional characterization monitoring is also being performed at an ultra-high volume site located on Interstate 5 at the Ship Canal Bridge in Seattle. This site has an ADT of approximately 214,000 and a surface area of approximately 36 acres. This is also the location of the ultra-urban stormwater technology testing facility and is discussed further in Section 7.2.2.

7.1.2 Pesticide and Priority Pollutant Metals Monitoring

As indicated in the previous section, catch basin sampling locations on SR 101 at MP 363 and on Interstate 5 at MP 106 in Olympia are currently being utilized as part of the stormwater pesticide and priority pollutant metals characterization monitoring program being conducted by the WSDOT EAO Water Quality Program pursuant to the requirements of their NPDES Phase I MS4 permit program. An additional sampling location is being utilized for this effort on Interstate 5 at the Ship Canal Bridge ultra-urban stormwater technology testing facility in Seattle. Sampling activities were performed at these locations in June 2002 by the WSDOT EAO Water Quality Program [Tetra Tech 2002(b)].

Analytical results for the priority pollutant metals indicated that chromium, copper, lead, nickel, and zinc were present in all catch basin samples at concentrations exceeding laboratory reporting limits. The reported concentrations of chromium and nickel were all below the 90th percentile background values for these inorganic elements published for the Puget Sound Region in the document entitled *Natural Background Soil Metals Concentrations in Washington State* (Ecology Publication No. 94-115, dated October 1994). The reported concentrations of copper, lead, and zinc at the SR 101 and Interstate 5 locations in Olympia were also below or comparable to the published natural background concentrations, while the concentrations at the Ship Canal Bridge sample station exceeded background values for these elements.

Review of the results for the pesticide analyses indicated that the chlorinated acid herbicide compound dichloroprop was detected in both the SR 101 catch basin and the Interstate 5 Ship Canal Bridge catch basin samples. Levels of dichloroprop ranged from 88 micrograms/kilogram (μg/kg) at SR 101 to 260 μg/kg at the Interstate 5 Ship Canal Bridge location. Dichloroprop is a common constituent in a variety of commercial herbicides. For comparative purposes, the concentration of this compound that has been published by Ecology as being protective of terrestrial plants and animals is 700 milligrams/kilogram (WAC 173-340-900). No other chlorinated acid herbicides or organochlorine pesticide constituents were detected in the samples analyzed at concentrations above laboratory reporting limits. One additional pesticide and priority pollutant monitoring event is currently scheduled for approximately June 2003.

7.1.3 BaySaver® Monitoring at State Route 101

A third part of the stormwater characterization monitoring activities is associated with the installation of a relatively new stormwater management system known as Baysaver®. These systems are also scheduled for effectiveness evaluation as part of the ultra-urban stormwater technology testing facility at the Ship

Canal Bridge location. However, it is also necessary for WSDOT to determine life cycle maintenance requirements for these systems. A monitoring plan, completed in 2002, presents the procedures to be used during the monitoring of the experimental stormwater BMP, the Baysaver® Separation System that has been installed at five locations along SR 101 within the City of Port Angeles, in Clallam County [Tetra Tech 2002(c)]. The goal of this effort is to characterize the life cycle maintenance requirements of the Baysaver® Separation System.

The WSDOT EAO Water Quality Program performed the first monitoring event for the Port Angeles Baysaver® units in May 2002. Monitoring activities were performed to determine the depth of sediment accumulation over time in each of the five units; to determine the concentration, volume, and characteristics of floatable pollutants retained in the aqueous phase within the units; and to characterize the accumulated sediments and water to be removed from the units relative to applicable solid or hazardous waste management requirements for disposal purposes.

For disposal purposes, analytical laboratory results were compared to the cleanup screening levels established for unrestricted land use by Ecology in the Model Toxics Control Act (MTCA) Cleanup Regulation (WAC 173-340) and Dangerous Waste Regulations (WAC 173-303). Laboratory analysis for the aqueous phase samples from the Baysaver® units revealed that heavy oil-range petroleum hydrocarbon constituents were present, but at concentrations that were below MTCA cleanup levels. In addition, laboratory analysis confirmed that heavy oil-range petroleum hydrocarbons were present in the sediments of the Baysaver® above MTCA Method A cleanup levels. Organic and inorganic analyses were also conducted following extraction using the protocols established for the toxicity characteristic leaching procedure (TCLP) to assess disposal options for maintenance and management purposes. TCLP analysis for semi-volatile organic compounds and those metals included in Ecology's definition of characteristic wastes were all below laboratory reporting limits, with the exception of barium. However, the barium results were well below established dangerous waste designation levels (WAC 173-303-090). Grain size analyses were also to assess sediment deposition characteristics performed between the primary and secondary settling chambers of two of the Baysaver® units. Laboratory analysis confirmed that the Baysaver® separation system was functioning properly with respect to sediment separation performance. Sediment depth measurements were also recorded during sampling and will be utilized as a baseline to assess sediment accumulation rates. Monitoring is currently scheduled to continue through January 2003. A final report of the results will be prepared at the conclusion of the monitoring effort.

7.1.4 Microtox® – Toxicity Studies

A Microtox® acute toxicity study was performed to determine the acute toxicity of NaCl, $CaCl_2$, IceBAN, and CMA as part of the project conducted on Highway De-icers on Peshastin Creek, with the results of this effort being summarized in the WSDOT 6th Year NPDES Annual Report (WSDOT 2001). No other monitoring projects using Microtox® testing are anticipated at this time.

7.2 RESEARCH AND BMP EFFECTIVENESS MONITORING

During the current 2001/2002 reporting period, WSDOT has continued with research efforts to evaluate new stormwater treatment technologies as well as evaluating methods for enhancing the effectiveness of existing BMPs. Although progress on a few of the projects was hampered by funding limitations, four of the six ongoing projects were essentially completed.

7.2.1 Infiltration BMP Research Project

In 1998, WSDOT and the United States Geological Survey (USGS) developed a joint agreement to evaluate and monitor the performance of soil additives to reduce infiltration rates of infiltration basins constructed in 1997 at the South Dupont interchange on Interstate 5. This effort was summarized in the 5th and 6th Year NPDES Annual Reports [WSDOT 2000(b), 2001]. A final report was completed in September 2001 (Ames, K. et al. 2001). The following is a summary of the report findings.

The ultimate goal of this experiment was to develop an infiltration medium that could be used in retention basins to decrease the infiltration rate to between 5 and 10 inches per hour, and also to decrease the concentrations of some pollutants in highway runoff. Fourteen infiltration media formulations of sand, clay, and mulch were tested to determine the best combination for attaining the target infiltration rate. From preliminary tests the three formulations with the closest infiltration rate to the target were selected for a larger-scale study. Replicate tests were conducted on the three formulations to determine which had the closest infiltration rate to the target and to verify the original results.

The first formulation selected was a mixture of 70-percent sand, 15-percent clay, and 15-percent mulch. A multiple cylinder infiltrometer test was then conducted with the selected infiltration media to provide additional infiltration rate estimates and to investigate the potential effects of the infiltration media on

water quality. The resultant steady-state infiltration rate was between 1 and 3 inches per hour; which was outside the targeted rate. Therefore, a second formulation was selected for additional testing.

The second formulation consisted of a mixture of 90-percent sand, 5-percent clay, and 5-percent mulch. Two batches were tested. The measured infiltration rates varied from between 9 and 10 inches per hour, to as high as 50 inches per hour. These variations were attributed to variations in the media formation or in packing of the media in the infiltrometer. Constraints on time and resources did not allow further investigation into the variable infiltration rates.

One water quality test was completed on the second formulation to assess pollutant removal. The results were variable. Further testing would be needed to establish a more confident estimate of removal efficiencies.

7.2.2 Ultra-Urban Stormwater Technology Test Facility

This test facility was constructed to provide an established location for ongoing testing of stormwater treatment technologies with the purpose of evaluating these potential best management practices and their applications. A summary of the facility design was provided in the 5th Year NPDES Annual Report [WSDOT 2000(b)], and a summary of the first four technologies selected for evaluation was provided in the 6th Year NPDES Annual Report (WSDOT 2001).

During 2001, four stormwater treatment devices were identified for testing at the Lake Union Ultra-Urban BMP test facility. The test facility is located underneath the Interstate 5 Lake Union Ship Canal Bridge in downtown Seattle, on the north side of the Ship Canal and represents ultra-high ADT conditions. The facility is designed to collect highway runoff from the north half of the Lake Union Ship Canal Bridge, and through the use of flow splitters and pipes route flow to four test bays. The intent of the project is to test individual stormwater control systems at each of the four established test bays.

During 2002, three devices were installed at the test facility; including: (1) the Jensen Precast Stormvault™ in Test Bay 1 (www.jensenprecast.com); (2) the Baysaver® Separation System (www.baysaver.com) in Test Bay 2; and (3) the Aqua-Filter™ unit by AquaShield™, Inc. (www.aquashieldinc.com) in Test Bay 3. Test plan summaries were completed for the three technologies [Taylor Associates 2001(a), 2001(b), and 2002(a)]. In addition, at Test Bay 1 (Stormvault™) installation of the monitoring equipment, development of a draft Quality Assurance Project Plan (QAPP) [Taylor

Associates 2002(b)], a preliminary hydraulic evaluation, and testing of one storm event were completed in 2002. Due to reductions in available funding, work at the test facility was temporarily stopped during May/July 2002. Funding for August 2002 through July 2003 has been secured to complete installation and testing of the StormFilter® system in Test Bay 4 (www.stormwatermgt.com). Performance and verification reports for the StormFilter® are expected to be completed during calendar year 2003.

Additional funding for testing of the other three technologies is actively being pursued by WSDOT staff. Once funding for testing at Test Bays 1 through 3 is secured, the work needed to complete testing will begin again.

7.2.3 Ecology Embankment/Trench Filter

The SR 167 Ecology Embankment Monitoring Project was conducted to evaluate the effectiveness of Ecology Embankments in removing highway runoff pollutants. This effort was summarized in the 6th Year NPDES Annual Report (WSDOT 2001). A final report was completed in June 2002 [Taylor Associates 2002(c)] and the findings are summarized below.

Between August 2001 and April 2002 nine storm events were monitored at the State Route 167 Ecology Embankment project site. Pollutant removal efficiencies were calculated for total suspended solids (TSS), turbidity, total recoverable zinc, dissolved zinc, total phosphorus, and ortho-phosphorus on a per storm basis and on an aggregate basis (all storm events combined).

Pollutant removal efficiencies for the individual parameters evaluated ranged from 69 to 97 percent for TSS, 47 to 94 percent for turbidity, 73 to 95 percent for total recoverable zinc, 60 to 97 percent for dissolved zinc, 12 to 90 percent for total phosphorus, and –1,250 to 64 percent for ortho-phosphorus. Aggregate removal efficiencies were approximately 91 percent for TSS, 85 percent for turbidity, 89 percent for total recoverable zinc, 89 percent for dissolved zinc, 74 percent for total phosphorus, and -73 percent for ortho-phosphorus.

Monitoring results from this project suggest that the Ecology Embankment system has potential for use as a highway runoff treatment BMP. The embankment was installed in 1996 and is still providing water quality treatment. Although the hydraulic and mass balance of the system was not fully resolved by this study, additional development could prove this system to be a candidate for inclusion in the Basic or

Enhanced Treatment Facility Menu as stipulated in the Stormwater Management Manual for Western Washington (Ecology 2001).

7.2.4 Vortechnics Monitoring Project

The SR 405 Vortechnics™ Monitoring Project was conducted to provide information to WSDOT regarding the removal efficiency and maintenance needs of the Vortechs™ Stormwater Treatment System. The Vortechs™ Stormwater Treatment System was to be used as a pre-treatment BMP. A final report was completed in April 2002 [Taylor Associates 2002(d)] and the findings are summarized below.

A total of 11 storm events were monitored between March 2001 and February 2002. Removal efficiencies were calculated on a per-storm basis and on an aggregate basis. TSS and total zinc removal efficiencies were fairly consistent between storm events. The aggregate removal efficiency for all storm events was approximately 20 percent for TSS and 2 percent for total zinc. These TSS removal efficiency results are not likely to meet Ecology's guidelines for emerging stormwater treatment technologies. However, it was noted that particle sizes measured at the inlet station were consistently smaller than the assumed typical particle size distribution from Ecology, and visual observations suggested that the net total sediment removal by the Vortechs was greater than the measured TSS removal [Taylor Associates 2002(d)].

Turbidity and total phosphorus removal efficiencies for individual storm events varied moderately. Both had an aggregate removal efficiency of approximately 15 percent overall. The reported removal efficiencies for dissolved zinc and ortho-phosphorus tended to vary substantially on the basis of individual storm events. Results for the removal of these constituents overall were determined to be approximately -35 percent.

Through this study it was determined that the Vortechs™ system would not be likely to meet Ecology's basic treatment criterion, but may meet Ecology's criteria for Pretreatment for Treatment Train/Retrofit Applications. Although there are no explicit performance standards for these applications, a lower standard of performance than would be required for basic treatment in stand-alone technologies may be acceptable.

In addition to water quality testing on the Vortechs™ system, maintenance needs were determined. Overall the Vortechs™ unit provided coarse solids removal and extended the maintenance cycle of the

downstream wet pond. It was determined that the Vortechs™ unit and adjacent upstream and downstream manholes would require sediment removal approximately every two years.

7.2.5 Vegetated/Compost Amended Filter Strip

A summary of this project was provided in the 5th Year NPDES Annual Report [WSDOT 2000(b)]. Limited preliminary monitoring occurred at this site during the current reporting period but was not completed due to funding constraints. Alternatives for renewing this effort are currently being evaluated.

7.2.6 Dry Well Retrofit System

A research project entitled *Field Evaluations Of A Cost Effective Method To Retrofit Stormwater Dry Wells Using Permeable Reactive Barriers*, being conducted by Washington State University (WSU), is in the final stages of completion (Yonge and Hossain 2000). The data has been collected and a master's thesis relating to the evaluation has been completed. The final report is currently in preparation.

The objective of this project was to evaluate the effectiveness of a Stormwater Permeable Reactive Infiltration Barrier (SPRIB) treatment media that was developed by USGS. This medium was tested in the laboratory and at a field site using near field-scale columns to determine its useful life span in terms of metals (copper, lead, and zinc) concentration reduction capacity and maintenance requirements to maintain acceptable infiltration rates. In results from simulated storm events, the SPRIB demonstrated total metal (copper, lead, and zinc) concentration reductions of greater than 99% and soluble metal concentration reductions from 91% to 98%. Surface clogging of the columns by particulate matter was shown to be the limiting factor in the useful life span of a non-maintained SPRIB. Based on the observed linear decline in infiltration rates due to sediment loading, the predicted life span of a SPRIB was estimated at 20 to 22 storms (anticipated to be approximately 6 months in the Spokane area) before infiltration fell below acceptable rates. However, maintenance (i.e.; removing the top 2 centimeters of material) returned the infiltration rate to 90% of its original value. Based on these results, it was recommended that the SPRIB technology be used following a pretreatment device that removes particulate matter.

SECTION 8.0
CERTIFICATIONS

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL STORMWATER PERMIT PROGRAM

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for willful violations.

Jerry W. Ailb
Director, Environmental Services
Washington State Department of Transportation

9/27/02
Date

SECTION 9.0
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APPENDIX A

WSDOT 2002 BMP CONSTRUCTION ACTIVITIES SUMMARY

TABLE A-1. NEW BMPS CONSTRUCTED IN CLARK COUNTY DURING THE 2001/2002 REPORTING PERIOD						
State Route	**Project Name**	**Mile Post or Station**	**Offset Direction**	**WQMA**	**BMP Type**	**Facility Size**
SR 500	Thurston Way Interchange	B 13+49 to B 17+13	Left	Clark County	Combination Wet Pond / BMP RD.05	11.80 ac-ft
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	316+10 to 317+25	Left	Clark County	Biofiltration Swale / BMP RB.05	0.95 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	316+22 to 317+25	Left	Clark County	Infiltration Trench	1830 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	317+25 to 318+00	Left	Clark County	Biofiltration Swale / BMP RB.05	0.21 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	317+25 to 317+76	Left	Clark County	Infiltration Trench	258 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	319+35 to 320+55	Right	Clark County	Biofiltration Swale / BMP RB.05	0.61 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	318+80 to 319+35	Right	Clark County	Infiltration Trench	1137 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	321+96 to 322+96	Left	Clark County	Biofiltration Swale / BMP RB.05	0.34 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	321+30 to 321+96	Left	Clark County	Infiltration Trench	741 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	326+50 to 327+50	Left	Clark County	Biofiltration Swale / BMP RB.05	0.25 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	327+50 to 327+85	Left	Clark County	Infiltration Trench	258 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	329+30 to 330+25	Left	Clark County	Biofiltration Swale / BMP RB.05	0.28 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	330+25 to 330+60	Left	Clark County	Infiltration Trench	353 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	332+50 to 333+40	Left	Clark County	Biofiltration Swale / BMP RB.05	0.20 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	333+40 to 333+70	Left	Clark County	Infiltration Trench	155 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	336+80 to 337+80	Left	Clark County	Biofiltration Swale / BMP RB.05	0.27 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	336+45 to 336+80	Left	Clark County	Infiltration Trench	258 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	323+05 to 324+05	Right	Clark County	Biofiltration Swale / BMP RB.05	0.31 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	322+70 to 323+05	Right	Clark County	Infiltration Trench	353 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	326+50 to 327+50	Right	Clark County	Biofiltration Swale / BMP RB.05	0.26 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	327+50 to 327+75	Right	Clark County	Infiltration Trench	199 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	329+00 to 329+70	Right	Clark County	Biofiltration Swale / BMP RB.05	0.30 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	328+74 to 329+00	Right	Clark County	Infiltration Trench	389 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	333+00 to 333+80	Right	Clark County	Biofiltration Swale / BMP RB.05	0.15 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	333+80 to 334+10	Right	Clark County	Infiltration Trench	105 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	336+80 to 337+80	Right	Clark County	Biofiltration Swale / BMP RB.05	0.27 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	336+40 to 336+80	Right	Clark County	Infiltration Trench	282 c.f.
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	338+85 to 339+60	Right	Clark County	Biofiltration Swale / BMP RB.05	0.17 acres
SR 500	Ward Rd. to NE 162nd Ave.-Stage 1	338+50 to 338+85	Right	Clark County	Infiltration Trench	145 c.f.
SR 503	NE 76th St. to NE 144th St.	511+50 to 513+75	Left	Clark County	Infiltration Pond / BMP RI.06	1.44 ac-ft
Note: Drywells were added to existing infiltration trenches to increase life and performance.		466+85	Left	Clark County	Drywell	
		466+85	Right	Clark County	Drywell	
		475+40	Left	Clark County	Drywell	
		475+40	Right	Clark County	Drywell	

TABLE A-2. NEW BMPS CONSTRUCTED IN THE NORTHWEST REGION DURING THE 2001/2002 REPORTING PERIOD (PAGE 1 OF 3)					
State Route	**Project Name**	**Mile Post or Station**	**Offset Direction[1]**	**WQMA**	**BMP Type**
SR 20	Zylstra Road	41+359 to 41+588	Left	Island	Bio-filtration Swale
SR 20	Zylstra Road	41+373 to 41+460	Left	Island	Vegetative Filter Strip
SR 20	Damnation Creek Bridge 20/283 Bridge Replacement	C 184+660 to C 184+785	Left	Upper Skagit	Vegetative Filter Strip
SR 20	Damnation Creek Bridge 20/283 Bridge Replacement	C 184+665 to C 184+818	Right	Upper Skagit	Vegetative Filter Strip
SR 20	Damnation Creek Bridge 20/283 Bridge Replacement	C 184+857 to C 184+927	Right	Upper Skagit	Vegetative Filter Strip
SR 20	Damnation Creek Bridge 20/283 Bridge Replacement	C 184+981 to C 185+021	Right	Upper Skagit	Vegetative Filter Strip
SR 20	Damnation Creek Bridge 20/283 Bridge Replacement	C 184+660 to C 184+725	Left	Upper Skagit	Infiltration Trench
SR 20	Damnation Creek Bridge 20/283 Bridge Replacement	C 184+665 to C 184+719	Right	Upper Skagit	Infiltration Trench
SR 520	Bike Path - Bellevue to Redmond	BI 60+00 to BI 62+00	Left	Cedar-Sammamish	Bio-filtration Swale
SR 5	Null Road to Sammamish	SB 11+377	Left	Lower Skagit-Samish	Oil / Water Separator
SR 5	Null Road to Sammamish	NB 11+414	Left	Lower Skagit-Samish	Oil / Water Separator
SR 5	Null Road to Sammamish	NB 11+772	Left	Lower Skagit-Samish	Oil / Water Separator
SR 5	Null Road to Sammamish	SB 12+051	Left	Lower Skagit-Samish	Oil / Water Separator
SR 5	Null Road to Sammamish	NB 13+487	Left	Lower Skagit-Samish	Oil / Water Separator
SR 5	Null Road to Sammamish	SB 9+945 to SB 10+121	Left	Lower Skagit-Samish	Bio-filtration Swale
SR 5	Null Road to Sammamish	F 12+227	Left	Lower Skagit-Samish	Wet Vault
SR 5	Null Road to Sammamish	F 12+279	Left	Lower Skagit-Samish	Wet Vault
SR 522	SR 9 to Paradise Lake Road	LC1 340+24	Left	Cedar-Sammamish	Wet Pond
SR 522	SR 9 to Paradise Lake Road	LC1 385+40	Right	Cedar-Sammamish	Wet Pond
SR 522	SR 9 to Paradise Lake Road	LM 455+12	Right	Cedar-Sammamish	Wet Pond
SR 522	SR 9 to Paradise Lake Road	LM 470+60 to LM 507+20	Left/Right	Cedar-Sammamish	Bio-filtration Swale
SR 522	SR 9 to Paradise Lake Road	LM 471+15 to LM 507+20	Right/Left	Cedar-Sammamish	Bio-filtration Swale
SR 516	SE Wax Road to Cedar Heights JHS and Jct 192nd Ave. SE	159+50 to 167+50	Left	Duwamish-Green	Vegetative Filter Strip
SR 516	SE Wax Road to Cedar Heights JHS and Jct 192nd Ave. SE	169+50 to 177+10	Left	Duwamish-Green	Vegetative Filter Strip
SR 516	SE Wax Road to Cedar Heights JHS and Jct 192nd Ave. SE	160+50 to 170+50	Left	Duwamish-Green	Infiltration Trench
SR 2	Snohomish River to Cavalero Corner Replace Eastbound Bridge – Stage 3	LE 61+56 to LE 64+00	Right/Left	Snohomish	Wetpond
SR 2	Snohomish River to Cavalero Corner Replace Eastbound Bridge – Stage 3	LE 64+80 to LE 76+80	Right/Left	Snohomish	Wetpond
SR 2	Snohomish River to Cavalero Corner Replace Eastbound Bridge – Stage 3	LE 77+70 to LE 95+10	Right/Left	Snohomish	Wetpond

TABLE A-2. NEW BMPS CONSTRUCTED IN THE NORTHWEST REGION DURING THE 2001/2002 REPORTING PERIOD (PAGE 2 OF 3)					
State Route	**Project Name**	**Mile Post or Station**	**Offset Direction[1]**	**WQMA**	**BMP Type**
SR 2	Snohomish River to Cavalero Corner Replace Eastbound Bridge – Stage 3	LE 95+90 to LE 101+05	Right/Left	Snohomish	Wetpond
SR 2	Snohomish River to Cavalero Corner Replace Eastbound Bridge – Stage 3	LE 102+40 to LE 105+20	Right/Left	Snohomish	Wetpond
SR 18	Holder Creek Vicinity Slope Stabilization	51+095 to 51+119	Left	Cedar-Sammamish	Bio-swale
SR 18	Holder Creek Vicinity Slope Stabilization	51+130 to 51+150	Left	Cedar-Sammamish	Dry Pond
SR 405	Bothell to Swamp Creek I/C HOV Lanes - Stage 1	L 41+945 to L 42+003	Right/Left	Cedar-Sammamish	Bio-filtration Swale
SR 405	Bothell to Swamp Creek I/C HOV Lanes - Stage 1	AR4 2+618 to AR4 2+672	Right	Cedar-Sammamish	Bio-filtration Swale
SR 405	Bothell to Swamp Creek I/C HOV Lanes - Stage 1	NBCD 9+305 to NBCD 9+385	Right	Cedar-Sammamish	Dry Pond
SR 405	Bothell to Swamp Creek I/C HOV Lanes - Stage 1	W-N 8+322 to W-N 8+350	Right	Cedar-Sammamish	Wet Vault (open)
SR 405	Bothell to Swamp Creek I/C HOV Lanes - Stage 1	LR 40+850 to LR 40+900	Right	Cedar-Sammamish	Wet Vault (open)
SR 405	Bothell to Swamp Creek I/C HOV Lanes - Stage 1	L 42+009 to L 42+029	Right/Left	Cedar-Sammamish	Wet Vault
SR 405	Bothell to Swamp Creek I/C HOV Lanes - Stage 1	L 42+633 to L 42+692	Right/Left	Cedar-Sammamish	Wet Vault
SR 405	Bothell to Swamp Creek I/C HOV Lanes - Stage 1	LR 41+438 to LR 41+497	Right	Cedar-Sammamish	Ecology Ditch
SR 405	Bothell to Swamp Creek I/C HOV Lanes - Stage 1	LR 41+170 to LR 41+210	Right	Cedar-Sammamish	Detention Pipe
SR 405	Bothell to Swamp Creek I/C HOV Lanes - Stage 1	NBCD 9+500	Right	Cedar-Sammamish	Swirl Concentrator Vault
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 35+610 to C 36+670	Left	Island	Bio-filtration Swale
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 36+390 to C 36+435	Right	Island	Bio-filtration Swale
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 36+665 to C 36+785	Right	Island	Bio-filtration Swale
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 37+650 to C 37+710	Left	Island	Bio-filtration Swale
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 35+790 to C 35+880	Right	Island	Vegetative Filter Strip
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 35+895 to C 36+050	Right	Island	Vegetative Filter Strip
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 36+065 to C 36+360	Right	Island	Vegetative Filter Strip
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 36+790 to C 36+855	Right	Island	Vegetative Filter Strip
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 36+870 to C 36+965	Right	Island	Vegetative Filter Strip
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 36+985 to C 37+070	Right	Island	Vegetative Filter Strip
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 37+090 to C 37+195	Right	Island	Vegetative Filter Strip
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 37+210 to C 37+230	Right	Island	Vegetative Filter Strip
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 37+245 to C 37+305	Right	Island	Vegetative Filter Strip
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 37+318 to C 37+380	Right	Island	Vegetative Filter Strip
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 35+550 to C 35+570	Left	Island	Dry Pond
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 36+390 to C 36+400	Right	Island	Dry Pond
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 36+710 to C 36+725	Right	Island	Dry Pond

TABLE A-2. NEW BMPS CONSTRUCTED IN THE NORTHWEST REGION DURING THE 2001/2002 REPORTING PERIOD (PAGE 3 OF 3)					
State Route	**Project Name**	**Mile Post or Station**	**Offset Direction[1]**	**WQMA**	**BMP Type**
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 35+555	Left	Island	Oil / Water Separator
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 36+850	Right	Island	Oil / Water Separator
SR 525	Cameron Road to SR 20 Stage 4 - Section 1	C 36+710	Right	Island	Oil / Water Separator
SR 525	SR 99 Interchange	X 3+900	Right	Cedar-Sammamish	Combination Pond
SR 525	SR 99 Interchange	X 4+050	Right	Cedar-Sammamish	Combination Pond
SR 525	SR 99 Interchange	X 4+400	Right	Cedar-Sammamish	Combination Pond
SR 525	SR 99 Interchange	X 4+500	Left	Cedar-Sammamish	Combination Pond
SR 525	SR 99 Interchange	X 4+825	Right	Cedar-Sammamish	Combination Pond
SR 525	SR 99 Interchange	X 5+300	Left	Cedar-Sammamish	Combination Pond
SR 525	SR 99 Interchange	X 3+935	Right	Cedar-Sammamish	Oil / Water Separator
SR 525	SR 99 Interchange	X 3+998	Right	Cedar-Sammamish	Oil / Water Separator
SR 525	SR 99 Interchange	EN 3+089	Right	Cedar-Sammamish	Oil / Water Separator
SR 525	SR 99 Interchange	WS 5+384	Right	Cedar-Sammamish	Oil / Water Separator
SR 525	SR 99 Interchange	X 4+775	Right	Cedar-Sammamish	Oil / Water Separator
SR 525	SR 99 Interchange	X 5+351	Left	Cedar-Sammamish	Oil / Water Separator

[1] Offset Direction is related to the type of project (i.e. mainline (centerline), HOV, interchange (on/off ramp), access road).

TABLE A-3. NEW BMPS CONSTRUCTED IN THE OLYMPIC REGION DURING THE 2001/2002 REPORTING PERIOD						
State Route	**Project Name**	**Mile Post or Station**	**Offset Direction[1]**	**WQMA**	**BMP Type**	**Facility Size**
SR 5	38TH Street Interchange	NW Ramp 7+310	Right	South Puget Sound	Detention Pond	6,500 sf
SR 5	38TH Street Interchange	NW Ramp 7+395	Right	South Puget Sound	Detention Pond	3,500 sf
SR 5	38TH Street Interchange	WN Ramp 4+170	Left	South Puget Sound	Detention Pond	4,800 sf
SR 5	38TH Street Interchange	SW Ramp 5+100	Right	South Puget Sound	Detention Pond	4,300 sf
SR 5	Sleater Kinney Interchange to College Street Overcrossing	MP 108.5 to MP 108.9	Left/Right	South Puget Sound	Stormwater Filter Strips	21,000 sf
SR 16	Sprague Ave. I/C To Snake Lake - HOV	A22 Line 1+260	Left	South Puget Sound	Detention Pond	6,800 sf
SR 16	Sprague Ave. I/C To Snake Lake - HOV	NCL2 Line 1+240	Right	South Puget Sound	Detention Pond	8,000 sf
SR 99	SR 99, 62ND Ave. E. TO King County Line	AR Line 11+32	Left	South Puget Sound	Detention Pond	2,100 sf
SR 99	SR 99, 62ND Ave. E. TO King County Line	AR Line 12+38	Left	South Puget Sound	Detention Pond	5,100 sf
SR 99	SR 99, 62ND Ave. E. TO King County Line	BS Line 1+56	Center Line	South Puget Sound	Bio-filtration Swale	470 sf
SR 167	River Road Safety Improvements	L Line 7+000	Left	South Puget Sound	Bio-filtration Swale	2,065 sf
SR 509	Port of Tacoma Rd. Grade Separation	SFRC Line 0+820	Right	South Puget Sound	Bio-filtration Swale	1,000 sf
SR 509	Port of Tacoma Rd. Grade Separation	NFRC Line 1+210	Right	South Puget Sound	Bio-filtration Swale	1,200 sf
SR 509	Port of Tacoma Rd. Grade Separation	NFRC Line 1+765	Right	South Puget Sound	Bio-filtration Swale	900 sf
SR 509	Port of Tacoma Rd. Grade Separation	SR509C Line 4+600	Right	South Puget Sound	Bio-filtration Swale	3,000 sf
SR 509	Port of Tacoma Rd. Grade Separation	SFRC Line 1+040	Right	South Puget Sound	Detention Pond	5,600 sf
SR 509	Port of Tacoma Rd. Grade Separation	SFRC Line 1+070	Right	South Puget Sound	Detention Pond	5,000 sf
SR 509	Port of Tacoma Rd. Grade Separation	SR509C Line 3+800	Left	South Puget Sound	Detention Pond	6,000 sf
SR 510	SR 510, SR 5 TO Pacific Avenue	MAR Line 1+140	Left	South Puget Sound	Infiltration Pond	18,300 sf
SR 510	SR 510, SR 5 TO Pacific Avenue	MR3 Line 2+318	Right	South Puget Sound	Infiltration Pond	19,400 sf
SR 510	SR 510, SR 5 TO Pacific Avenue	PAC Line 0+890	Left	South Puget Sound	Infiltration Pond	33,400 sf
SR 507	Bald Hill Rd. To MP 36.5	SR507 Line 10+700	Left	South Puget Sound	Bio-filtration Swale	1,075 sf
SR 507	Bald Hill Rd. To MP 36.5	SR507 Line 10+830	Right	South Puget Sound	Bio-filtration Swale	340 sf

APPENDIX B

WSDOT 2002 STORMWATER MONITORING AND RESEARCH ACTIVITIES SUMMARY

TABLE B-1. WSDOT MONITORING PROJECTS ACTIVE DURING 2001-2002 REPORTING PERIOD[1]			
Project Name (Report Section)	**Status**	**Project Description**	**Stormwater Management Plan Table 21 Cross Reference**
Long Term Characterization (Section 7.1.1)	In Progress • Monitoring occurring 2001-2003 at selected sites. • Summarized in 2001 NPDES Annual Report. • Report anticipated in 2003	This entails characterization of runoff from sites with different traffic volumes.	Not specifically referenced. However, the following were related to this work: SR 5 / 169-M-0 SR 5 / 2.80-R-65 SR 5 / 18.19-L-65
Pesticide/Priority Pollutant Scans (Section 7.1.2)	Annual Dry Season Testing • Summarized in 2001 NPDES Annual Report.	Determine pesticide and priority pollutant metals concentrations in accumulated sediments from long-term characterization sites and others.	Not Referenced
BaySaver SR 101 (Section 7.1.3)	In Progress • Summarized in 2001 NPDES Annual Report. • Report due 2003 .	Characterize accumulated sediments to determine maintenance needs and disposal options.	Not Referenced
Infiltration BMP Research Dupont (Section 7.2.1)	Completed [Ames, et. al. 2001] • Summarized in the 1999, 2000, and 2001 NPDES Annual Reports.	Originally used gypsum soil additives to limit infiltration rates in infiltration basins. However, the project shifted to developing a filtration media that could be used to top-dress infiltration basins.	SR 5 / 118.9
Ultra-Urban Stormwater Treatment Testing (Ship Canal) (Section 7.2.2) This location may also serve as characterization site for ultra-high volume >200,000 ADT	• Summarized in the 1998,1999, 2000, and 2001 NPDES Annual Reports. • Sampling plans/QAPPs will be developed during 2002. • Test plan summaries were completed for three technologies in 2002 • Performance reports for all technologies expected in 2003. • Verification reports for all technologies expected in 2004. • Long-term research facility.	Testing of pollutant removal efficiency of four different stormwater treatment components appropriate for confined spaces: Stormvault (Wet vault w/ patented baffle system), Bay Savers/Bay Filter (Multi-chambered gravity separation w/ concentric filter of sand & other media), Aqua Shield/Aqua Filter (Swirl Concentrator w/ filtration chamber), Stormfilter (Vault w/ filtration cartridges).	SR 5 / 169-M-0
Ecology Embankment/ Trench Filter SR 167@ Kent and Auburn (Section 7.2.3)	Completed [Taylor and Assoc. 2002(c)] • Summarized in the 2001 NPDES Report.	Evaluate effectiveness of media filtration in roadway embankments for pollutant removal.	SR 167 / 25.35
Vortechs Swirl Concentration System SR 405 (Section 7.2.4)	Completed [Taylor and Assoc. 2002(d)] • Summarized in the 2001 NPDES Report.	Evaluation of the pollutant removal effectiveness of a Vortechnics unit.	SR 405 / 24.54-L-8
Vegetated/ Compost Amended Filter Strip - Sleater-Kinney to Marvin (Section 7.2.5)	Not Active • Summarized in the 1999, 2000, and 2001 NPDES Annual Reports. • Not prioritized for funding.	Testing treatment effectiveness of vegetated/compost amended filter strips on roadside runoff rates and water quality.	Not Referenced
Dry Well Retrofit System – Spokane (Section 7.2.6)	In Progress • Summarized in the 2001 NPDES Annual Report. • Report due in 2003.	Investigate a drywell retrofit strategy using SPRIB treatment media developed by the USGS.	Not Referenced

[1] All active monitoring projects are summarized in the 2002 NPDES Annual Report.

TABLE B-2. WSDOT MONITORING PROJECTS PREVIOUSLY COMPLETED AND SUMMARIZED			
Project Name	**Status**	**Project Description**	**Stormwater Management Plan Table 21 Cross Reference**
Vegetated Stormwater Facility Maintenance	Completed • Summarized in the 2001 NPDES Annual Report.	Assess routine highway ditch cleaning alternatives to evaluate conditions benefiting water quality and assess restabilization and revegetation options.	Not Referenced
Contaminant Detention in Highway Grass Filter Strips - SR 8	Completed • Summarized in the 1999 and 2001 NPDES Annual Reports.	Investigation of potential for vegetated highway shoulders with different surface soils to remove pollutants.	SR 8 / 15.8-L-22
Road Shoulder Treatments	Completed • Summarized in the 2001 NPDES Annual Report.	Test different shoulder treatments (conventional asphalt, gravel, or porous asphalt) to determine which yields the least quantity of runoff with the highest quality.	Not Referenced
PAM for Soil Erosion Control (SR 18)	Completed • Summarized in the 1999 NPDES Annual Report.	Tested the performance of PAM to abate soil erosion and improve soil texture. Evaluated the optimum dosing method and application rates for prevention of erosion to exposed soils as evaluated through runoff turbidity data.	SR 18 / 6.72-R-42
PAM Flocculant Dissolution	Completed • Summarized in the 1999 and 2000 NPDES Annual Reports.	Rate testing conducted for an Experimental Passive Dosing System to reduce stormwater turbidity.	SR 18 / 6.72-R-42

TABLE B-3. STATUS OF WSDOT MONITORING PROJECTS NOT SUMMARIZED IN THE 2002 NPDES ANNUAL REPORT			
Project Name	**Status**	**Project Description**	**Stormwater Management Plan Table 21 Cross Reference**
Microtox Testing	No monitoring occurring at this time • Summarized in 2001 NPDES Annual Report.	Evaluation of stormwater and receiving water toxicity.	Not Referenced
Bike Path Runoff Characterization I 5	Not Active	Characterization of bike path runoff. This project was requested by the regional project office and is not related to any specific NPDES requirement.	Not Referenced
Stormceptor Vaults SR 522	Not Active • Monitoring canceled due to hazardous location.	Pollutant removal effectiveness testing on installed facilities.	SR 522 / 6.63-R-15
Ecology Ditch SR 5 Mountlake Terrace	Possible future need. • No new installations to test.	Evaluate the effectiveness of the use of this treatment mechanism (a bioswale underlain with perforated pipe and sand).	Not Referenced
SR 5 / North Clark County Stormwater Characterization – Low Impervious Surface	Cancelled • New site identified at SR 101 near Olympia (See Table B-1 Long Term Characterization).	Characterize stormwater runoff from a site with a medium ADT volume.	SR 5 / 18.19 L-65
SR 5 Vancouver	Cancelled • New site identified at SR 5 in Olympia (See Table B-1 Long Term Characterization).	Characterize stormwater runoff from a site with a high ADT volume.	SR 5 / 2.80-R-65
South Snohomish County Multi-cell Wetpond Evaluation	Cancelled • Not prioritized for funding.	Evaluate treatment effectiveness of a multi-cell wetpond with a constructed wetland.	SR 5 / 184.3-R-24

APPENDIX C

WSDOT TESC/SPCC ASSESSMENT FORM

WSDOT TESC/SPCC Assessment Form

General

Assessment Date
Name of Assessor
Site Name
Contract Number
WSDOT Region
Date of Last Site Assessment
Name of WSDOT Inspector

Site Performance History

	TESC	SPCC
No problems	☐	☐
Minor problems	☐	☐
Major problems	☐	☐

Ecology and Other Corrective Action

	TESC	SPCC
None	☐	☐
Informal	☐	☐
Notice of correction	☐	☐
Notice of violation	☐	☐

Is this assessment for TESC, SPCC, or both? ____
Has water quality sampling been performed? (y/n) ____

Percent complete ____

Weather in past 24 hours

No rain ☐
Light rain ☐
Heavy rain ☐

Ref #	**BMP Assessment – Temporary Erosion and Sediment Control**	
1	TESC file on site and complete, including recent inspection reports? (8-01.3(1)B)	(yes or no)
2	Contractor's Erosion Control Lead is identified in plan and currently certified? (8-01.3(1)B)	(yes or no)
3	TESC Plan has been updated with current site conditions? (8-01.3(1)B)	(yes or no)
4	Does/would site runoff meet water quality standards?	(yes or no)

Minimum Requirement #1 a – Soil Stabilization

5	Are the soil stabilization BMPs effectively preventing erosion?	(yes, no, or N/A)
6	Percent of site stabilized with BMPs	%

	Soil Stabilization BMPs	In use? (yes/no)	In original plan? (yes/no)	Applied per plan/specs? (yes/no)	Maintained per specs? (yes/no)	Effectiveness (low, medium, high, or N/A)
7	Seeding and fertilizing (8-01.3(2))					
8	Mulching (8-01.3(2))					
9	Erosion control blankets (8-01.3(3))					
10	Plastic covering (8-01.3(4))					
11	Polyacrylamide (8-01.3(1))					
12	Surface roughening (2-03.3)					
13	Planting and topsoiling (8-02)					
14	Sodding (8-02.3(15))					

Minimum Requirement #1 b – Sediment Trapping

15	Is the Contractor effectively preventing dust-related air quality problems?	(yes, no, or N/A)
16	Are BMPs effectively trapping sediment in runoff?	(yes, no, or N/A)

	Sediment Trapping BMPs	In use? (yes/no)	In original plan? (yes/no)	Applied per plan/specs? (yes/no)	Maintained per specs? (yes/no)	Effectiveness (low, medium, high, or N/A)
17	Silt fence (8-01.3(9)A)					
18	Gravel filter or wood chip/compost berm (8-01.3(9)B)					
19	Brush barrier (8-01.3(9)C)					
20	Straw bale barrier (8-01.3(9)D)					
21	Wattles (8-01.3(10))					
22	Sediment trap					
23	Infiltration					
24	Temporary sediment pond (8-01.3(1)D)					
25	Vegetated strip					
26	Other/experimental BMPs:					

Ref #	***Minimum Requirement #2 – Delineate Clearing and Easement Limits***		
27	Are all clearing limits around sensitive areas clearly delineated with fencing?	(yes, no, or N/A)	
28	Do the limits minimize site area cleared and maximize preservation of natural vegetation?	(yes, no, or N/A)	
29	Are the limits being respected by the contractor?	(yes, no, or N/A)	
	Minimum Requirement #3 – Protection of Adjacent Properties (and Waters of the State)		
30	Are sediments effectively retained on site, protecting adjacent properties, roadways, and waterways?	(yes, no, or N/A)	
31	Is street sweeping currently implemented on adjacent roadways?	(yes, no, or N/A)	
32	If so, is it effectively protecting drainage facilities and waterways from sediment deposition?	(yes or no)	
33	If not, should street sweeping be initiated?	(yes or no)	
	Minimum Requirement #4 – Timing and Stabilization of Sediment Trapping Measures (Detention Pond)		
34	Are sediment trapping BMPs in place per specs before land-disturbing activities take place?	(yes, no, or N/A)	
	Minimum Requirement #5 – Cut and Fill Slopes		
35	Are BMPs effectively protecting slopes from concentrated flow?	(yes, no, or N/A)	

	Slope protection BMPs	In use? (yes/no)	In original plan? (yes/no)	Applied per plan/specs? (yes/no)	Maintained per specs? (yes/no)	Effectiveness (low, medium, high, or N/A)
36	Soil stabilization BMPs (see Req. #1)					
37	Pipe slope drains					
38	Interceptor dike or swale					
39	Slope dewatering					
40	Gradient terraces					
41	Curb above slope					

	Minimum Requirement #6 – Controlling Off-Site Erosion		
42	Is all site runoff captured and conveyed to sediment trapping BMPs and detention facilities?	(yes, no, or N/A)	
43	Is site runoff discharged from detention facilities at design rates?	(yes, no, or N/A)	
	Minimum Requirement #7 – Stabilization of Temporary Conveyance Channels and Outlets		
44	Is off-site runon diverted around construction areas?	(yes, no, or N/A)	
45	Are the conveyance channel and outlet stabilization BMPs effectively preventing erosion?	(yes, no, or N/A)	

	Conveyance channel and outlet stabilization BMPs	In use? (yes/no)	In original plan? (yes/no)	Applied per plan/specs? (yes/no)	Maintained per specs? (yes/no)	Effectiveness (low, medium, high, or N/A)
46	Check dams: geotextile-encased foam (8-01.3(5))					
47	Check dams: rock (8-01.3(5))					
48	Check dams: sandbag (8-01.3(5))					
49	Riprap channel lining					
50	Erosion control blankets (8-01.3(3))					
51	Grass-lined channel					
52	Level spreader					
53	Outlet protection					

	Minimum Requirement #8 – Storm Drain Protection		
54	Are inlets protected from sediment-laden runoff?	(yes, no, or N/A)	
55	Inlet protection (8-01.3(9))		
	Minimum Requirement #9 – Underground Utility Construction (Western Washington Only)		
56	Are trench excavations limited to 500 feet in open length at any one time?	(yes, no, or N/A)	
57	Excavated material placed on uphill side of trench when possible?	(yes, no, or N/A)	
	Minimum Requirement #10 – Construction Access Routes		
58	Are the access route BMPs effectively protecting nearby roads from sediment deposition?	(yes or no)	

	Construction access route BMPs	In use? (yes/no)	In original plan? (yes/no)	Applied per plan/specs? (yes/no)	Maintained per specs? (yes/no)	Effectiveness (low, medium, high, or N/A)
59	Stabilized construction entrance (8-01.3(6))					
60	Construction road stabilization					
61	Parking/staging area stabilization					
62	Tire wash (8-01.3(6))					

Ref #	***Minimum Requirement #11 – Removal of Temporary BMPs***	
63	Have temporary BMPs been removed in areas that are completely stabilized? (8-01.3(12))	(yes or no)
	Minimum Requirement #12 – Dewatering Construction Sites	
64	Is site ground water controlled, treated, and/or discharged per specifications? (8-01.3(1)C)	(yes, no, or N/A)
	Minimum Requirement #13 – Maintenance	
65	On a scale of 1 to 10, how well are the site BMPs maintained? (8-01.3(11))	1 (worst); 10 (best)
	TESC BMP Corrective Actions (Maintenance & repair of BMPs, additional BMPs, etc.)	

BMP Assessment - Spill Prevention, Control, and Countermeasures

66	SPCC plan on site? (draft GSP 8-01.3)	(yes or no)
67	SPCC plan reflects current site conditions?	(yes or no)

			To soil	To water
68	Has a spill occurred on site?	(yes or no)		
69	If so, was it an incidental spill (small equipment leak)?	(yes or no)		
70	Was it a major spill (more than 10 gallons to soil or spill to water)?	(yes or no)		
71	Were notification measures taken?	(yes or no)		
72	Were response measures taken?	(yes or no)		
73	Were final cleanup measures taken?	(yes or no)		
74	Is there any residual contamination remaining on site?	(yes or no)		

	Spill Control BMPs	In use? (yes/no)	In original plan? (yes/no)	Applied per plan/specs? (yes/no)	Maintained per specs? (yes/no)	Effective (yes, no, N/A)
75	Chemical / Hazardous material / Waste storage BMPs					
76	If not in the SPCC plan, is it a regulatory requirement?				(yes or no)	
77	Spill kit present?				(yes or no)	
78	Are containers sealed?				(yes or no)	
79	Are containers labeled?				(yes or no)	
80	Are materials stored in a covered location that is protected from precipitation?				(yes or no)	
81	Are secondary containment measures employed?				(yes or no)	
82	Fueling and chemical loading/unloading BMPs					
83	If not in the SPCC plan, is it a regulatory requirement?				(yes or no)	
84	Spill kit present?				(yes or no)	
85	Are secondary containment measures employed?				(yes or no)	
86	Designated area for equipment/vehicle storage					
87	If not in the SPCC plan, is it a regulatory requirement?				(yes or no)	
88	Evidence of spills/ leaks in this area?				(yes or no)	
89	Is there leak protection on/under parked vehicles and equipment?				(yes or no)	
90	Concrete truck wash water BMPs					
91	If not in the SPCC plan, is it a regulatory requirement?				(yes or no)	
92	Is wash water properly disposed?				(yes or no)	

Spill Control Actions and Recommendations

93	Are changes needed to meet SPCC plan requirements?	(yes or no)	
	List changes needed:		
94	Are actions required to meet contractual obligations?	(yes or no)	
	List the actions:		
95	Are actions needed to comply with applicable laws, even if the SPCC plan requirements are met and the contractual obligations fulfilled?	(yes or no)	
	List the actions:		
96	List any other actions recommended to improve SPCC effectiveness:		